MONITORING WELL INSTALLATION AND GROUNDWATER SAMPLING REPORT

Port of Portland Marine Terminal 1 South 2100 NW Front Avenue Portland, Oregon

December 19, 2001



HAHN AND ASSOCIATES, INC. **Environmental Management**

434 NW 6th Avenue, Suite 203 Portland, Oregon 97209-3600 503/796-0717 • 503/227-2209 FAX

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December 19, 2001

Prepared for:

The Port of Portland Portland, Oregon

Prepared by:

Hahn and Associates, Inc. Portland, Oregon

HAI Project No. 5106 DEQ ECSI File No. 2642

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HAHN AND ASSOCIATES, INC. ENVIRONMENTAL CONSULTANTS

December 19, 2001

Mr. Joe Mollusky The Port of Portland P.O. Box 3529 Portland, Oregon 97208

HAI Project No. 5106 DEQ ECSI File No. 2642

Subject: Monitoring Well Installation and Groundwater Sampling Report; Port of Portland Marine Terminal 1 South, 2100 NW Front Avenue, Portland, Oregon

Dear Mr. Mollusky:

1. Introduction

The Port of Portland (the Port) retained Hahn and Associates, Inc. (HAI) to conduct groundwater investigation activities at Marine Terminal 1 South located at 2100 NW Front Avenue, Portland, Oregon (Figure 1). The work activities, conducted in August, September, and October 2001, included the installation, development, and sampling of seven groundwater monitoring wells at the site. The work activities were conducted in response to a July 26, 2001, Oregon Department of Environmental Quality (DEQ) letter¹ requesting further characterization of site groundwater via monitoring well installation and sampling to supplement remedial investigation (RI) activities at the site. All work unless otherwise noted, was conducted according to the Site Characterization Work Plan², Work Plan Addendum³, and the August 7, 2001, DEQ Work Plan Addendum response letter⁴ to the Port.

2. Objectives

The primary objectives of the monitoring well installation and sampling activities were to:

- 1) Establish permanent sampling points for monitoring the shallow groundwater at the site
- 2) Validate push probe boring data and further determine the magnitude of impacts to groundwater

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¹ Oregon Department of Environmental Quality (2001a). Comments Remedial Investigation Report, Marine Terminal 1 South, Portland, Oregon, ESCI No. 2642. July 26, 2001.

² Hahn and Associates, Inc. (2000). Work Plan for Supplemental Site Characterization, Marine Terminal 1 South Redevelopment, 2100 NW Front Avenue, Portland, Oregon. August 31, 2000.

³ Hahn and Associates, Inc. (2001b). Work Plan (Addendum No. 2) For Groundwater Monitoring, 2100 NW Front Avenue, Portland, Oregon. August 1, 2001.

⁴ Oregon Department of Environmental Quality (2001b). Comments, Work Plan (Addendum No. 2), Marine Terminal 1 South, Portland, Oregon, ESCI No. 2642. August 7, 2001.

- 3) Establish background groundwater quality at the site
- 4) Establish groundwater flow direction beneath the site
- 5) Collect groundwater data suitable for evaluating the surface water pathway and of sufficient quality to support the site risk assessment.

3. Background

3.1 Current Site Features

The site consists of approximately 21 acres in Marine Terminal 1 that is located northwest of Interstate 405 (Fremont Bridge), northeast of NW Front Avenue, southeast of Slip No. 2, and southwest of the Willamette River (the Site)(Figure 2). Two primary structures, designated as Warehouse No. 2 and House No. 104, are currently located at the Site. Portions of the Site are currently leased by one tenant, Tristar Transload who operates the open storage area southeast of Slip No. 2 and northwest of House No. 104 and portions of House No. 104. The remaining portions of the Site are currently unoccupied. Additionally, an extensive dock structure is present over submerged land at Berths 104, 105, and 106.

The topography at the Site is generally level at an elevation of approximately 30 feet above mean sea level (msl). The Site is generally paved with asphalt or concrete with little or no vegetation or bare ground present.

3.2 Investigations History

In 1998 and 2000, RI activities were conducted at the Site and beneath a portion of NW Front Avenue adjoining the Site. A total of 112 push probe borings were installed for the collection of soil and groundwater samples during the work activities. The initial environmental site assessment (ESA) phase of investigation was conducted by Maul Foster⁵; the subsequent phases of investigation were conducted by HAI and are documented in the RI report⁶ prepared for the Site.

⁵ Maul Foster and Alongi, Inc., (1998). Focused Environmental Site Assessment, Terminal 1, Between Slip No. 2 and the Freemont Bridge, Northwest Portland, Oregon. August 25, 1998.

⁶ Hahn and Associates, Inc. (2001a). Terminal 1 South Remedial Investigation Report, Port of Portland Marine Terminal 1 South, 2100 NW Front Avenue, Portland, Oregon. July 12, 2001.

As detailed in the RI report, the nature and extent of contamination at the Site is summarized as follows:

- The contaminants of potential concern (COPCs) identified in Site soils and groundwater are polynuclear aromatic hydrocarbons (PAHs) and three metals (arsenic, copper, and lead).
- Seven general areas/locations of soil impacted with petroleum hydrocarbons have been identified at the Site, including the former Slip No. 1, B-5, B-20, B-29, B-37 (dry well), B-38, and B-102 Areas (Figure 3). The B-102 Area is considered an offsite, up-gradient impact unrelated to Terminal 1 South.
- Two areas contained significant petroleum contamination in soil with COPCs at concentrations above Risk-Based Screening Levels (RBSLs): the B-37 (dry well) Area and the B-38 Area.
- Soil impacts extend to the depth of the water table at the B-37 (dry well) and B-38 Areas.
- Analytical testing detected PAHs in soil at concentrations exceeding RBSLs at the B-20, B-37 (dry well), and B-38 Areas.
- Arsenic was detected in soil at concentrations exceeding the established site background level of 5.3 parts per million (ppm) at borings B-3 and B-11, and in the B-38 Area. Lead was detected in the B-38 Area at concentrations exceeding RBSLs and site background levels.
- Analytical testing of groundwater samples indicates PAHs were detected at concentrations above RBSLs in the B-37 (dry well) and B-38 Areas. Arsenic, copper, and lead were also detected in groundwater at concentrations above RBSLs.

Based on the results of the RI, DEQ requested that additional groundwater investigations be conducted at the Site. The report herein documents the installation of seven groundwater monitoring wells at the Site in August 2001, and groundwater sampling activities conducted in September and October 2001.

4. Field Activities

On August 27, 28, and 29, 2001, HAI supervised the installation of seven groundwater monitoring wells (MW-1 through MW-7) at the Site (Figure 2). On September 6, 7, and 10, 2001, the monitoring wells were developed, and on September 28 and October 1, 2001, groundwater samples were collected from all seven monitoring wells. An additional water level monitoring event was conducted on October 30, 2001.

4.1 Work Plan Modifications

Several modifications to either the Work Plan (Addendum No. 2) (HAI 2001b) or DEQ Work Plan Addendum response (DEQ 2001b) were made during an August 22, 2001, telephone communication with the DEQ (Guy Tanz to Rod Struck) as follows:

Area	Modification	Rational
B-38	Soil samples were not collected from MW-1 or MW-2 borings for laboratory analysis	Push probe sampling already documented impacted soil in these areas
B-37 (Dry Well)	MW-5 was located as proposed in the Work Plan Addendum (No. 2), not at the adjusted location suggested by DEQ	Adjusted well location for future well access
B-37 (Dry Well) and B-38		If concentrations of target compounds in source area wells are not detected, or are below screening values, they can be eliminated from monitoring at down-gradient wells

4.2 Monitoring Well Installation

On August 27, 28, and 29, 2001, a groundwater monitoring well network consisting of seven (7) shallow monitoring wells was installed at the Site (Figure 3). The monitoring wells were located based on the following criteria:

- 1) Within and down-gradient of areas of primary groundwater impact, specifically the B-37 (dry well) and B-38 Areas (MW-1 through MW-5)
- 2) At locations suitable for evaluation of the groundwater to surface water pathway; i.e. along the riverfront (MW-3, MW-5, and MW-7)
- 3) At locations, wherever practicable, to validate push probe boring data (MW-1, MW-2, MW-3, MW-4, MW-6, and MW-7)
- 4) In one or more locations that could be used to establish background groundwater quality at the site, if possible (MW-6)

Monitoring wells MW-1, MW-2, and MW-3 were installed in the B-38 Area, monitoring wells MW-4 and MW-5 were installed in the B-37 (dry well) Area, and monitoring wells MW-6 and MW-7 were installed in the southeastern portion of the site.

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MW-1, MW-2, and MW-4 were placed at locations in or immediately down-gradient of primary groundwater impact areas to monitor groundwater quality and assess plume stability. Down-gradient monitoring wells MW-3, MW-5, and MW-7 were placed within approximately 75 feet of the Willamette River bank to provide groundwater quality down-gradient of known sources and to evaluate the groundwater to surface water pathway. MW-6 was placed in an up-gradient area to assess background groundwater quality at the Site to provide an additional hydrogeological control point.

Several borings were advanced in the MW-7 Area where augers encountered woody debris. Two samples No. 5106-010827-002 and 5106-010827-003, that were primarily composed of wood, were collected from the first boring installed on August 27, 2001. MW-7 was ultimately constructed on August 29, 2001.

4.2.1 Monitoring Well Installation Procedures

All monitoring well installation work was performed by an Oregon-bonded and licensed monitoring well constructor (Geo-Tech Explorations, Inc. of Tualatin, Oregon). The monitoring wells were installed in accordance with the Oregon Groundwater Law (Oregon Revised Statute (ORS) Chapter 537) and the Rules for Construction and Maintenance of Monitoring Wells and Other Holes in Oregon (Oregon Administrative Rules (OAR) Chapter 690, Division 240).

During the drilling of the monitoring well borings, the soils were sampled at 5-foot intervals with a split-spoon sampling device for geologic logging purposes.

The monitoring wells were installed with a hollow stem auger drilling rig equipped with 6-inch and 5/8-inch inside-diameter (ID) hollow stem augers. The monitoring wells were constructed with 2-inch ID, threaded, Schedule 40, polyvinyl chloride (PVC), blank casing and slotted screen. Fifteen (15) feet of 0.010-inch slotted screen was set at the bottom of each well with screen intervals of 17 to 32 feet bgs at all wells with the exception of MW-5 that was installed from 19 to 34 feet bgs to compensate for an elevated loading dock. Blank casing extends from the top of the screen to the ground surface.

The sand pack was placed in the annular space from the bottom of the boring to 2 feet above the top of the screen with a Colorado 10/20 silica sand. The wells were then developed with a surge block to set the sand pack. A well seal composed of 3/8-inch bentonite chips was then placed on top of the sand pack to a depth of 1.5 feet bgs and hydrated.

The monitoring wells were completed with flush well monuments cemented in at the surface. The well casings were fitted with locking caps. A summary of monitoring well construction is in Table 1, and monitoring well construction logs are included in Appendix A.

Following the installation of the monitoring wells, on September 6, 7, and 10, 2001, the monitoring wells were further developed by purging with a pump in an attempt to remove the fine sediment from around the well bore. During development, at least 10 well volumes of water were removed from each well. The parameters of pH, temperature, conductivity,

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redox potential, dissolved oxygen, and turbidity were measured for stabilization. All parameters stabilized during the development process with the exception of turbidity due to a faulty meter. However, turbidity was measured with an operable meter during the sampling process (Section 4.2.2) and found to be stable. Accordingly, monitoring well development was deemed complete. Monitoring well development records are in Appendix B.

On September 11, 2001, the relative locations and elevations of the monitoring wells were surveyed to a City of Portland Datum by the Port of Portland (Appendix C).

4.2.2 Monitoring Well Sampling Procedures

On September 28 and October 1, 2001, the groundwater at the 7 monitoring wells was sampled. Prior to sampling, at least 3 well volumes of water were purged from each well using a submersible pump and disposable polyethylene tubing. The pH, temperature, conductivity, redox potential, dissolved oxygen, and turbidity of the water were measured during the purging process to monitor for stabilization of these parameters. Monitoring well purge records are in Appendix B.

Following completion of purging the well, a representative sample of the groundwater was obtained using either the submersible pump [TPH, PAHs, metals, and total suspended solids (TSS)] or a new disposable bailer (VOCs). The water was carefully transferred to the appropriate sampling containers that were completely filled such that no headspace was present that would allow the loss of volatiles. The sample bottles were then transferred to a chilled container for shipment to the analytical laboratory.

The static water levels in all the monitoring wells were measured on September 28, 2001, prior to the sampling event, using a Solinst water level indicator (conductive probe). The water levels were measured from the north side of the top of the casing. An additional water level monitoring event was conducted on October 30, 2001. Static water level measurements are summarized on Table 2; field logs are in Appendix B.

4.3 <u>Decontamination Procedures</u>

All well installation equipment, as well as all reusable soil sampling equipment, were steam-cleaned between boring locations to prevent cross-contamination. In addition, soil sampling equipment was cleaned between each sample using a detergent wash and two tap water rinses. New, disposable tubing and bailers were used between each well location for the groundwater sampling activities. The submersible pump was cleaned between each sample using a detergent wash and two tap water rinses.

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4.4 Investigative-Derived Waste

Soil cuttings generated during drilling of the monitoring well borings were placed in 25 55-gallon drums and left on site for future disposal.

Development water, purge water, and decontamination water generated during the drilling and sampling activities was containerized in 11 55-gallon drums and left on site for future disposal.

All investigative derived waste generated during the RI activities are stored at a secure location between House No. 104 and Warehouse No. 2.

5. Analytical Tests

VOCs

The soil sample and groundwater samples were shipped with chain-of-custody documentation in sealed and chilled containers to North Creek Analytical in Beaverton, Oregon, for analysis.

One select soil sample, collected from the boring at MW-6 to assess for its suitability as a background well, as per DEQ Work Plan Addendum No. 2 Comments (DEQ 2001b), was analyzed for the following parameters:

Parameter	Analytical Method

Diesel-Range Petroleum Hydrocarbons NW (Northwest) TPH-Dx

Oil-Range Petroleum Hydrocarbons NW TPH-Dx

PAHs EPA 8270 SIM

Priority Pollutant Metals * EPA 6010/7000 Series

* Antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, zinc

The results of the analytical testing for the soil sample are summarized on Table 3; the laboratory reports and chain-of-custody documentation are included in Appendix D.

HAHN AND ASSOCIATES, INC.

Environmental Protection Agency (EPA) 8260B

Groundwater samples collected during the groundwater monitoring activities were analyzed for the following parameters:

Parameter

Analytical Method

Diesel-Range Petroleum Hydrocarbons NW TPH-Dx

VOCs

EPA 8260B

DEHP

EPA 8270C

PAHs

EPA 8270 SIM

Total Suspended Solids

EPA 160.1

Priority Pollutant Metals:

unfiltered1 and filtered2

EPA 6010/7470A

- 1 antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, zinc
- 2 arsenic, copper, lead

The results of the analytical testing for the groundwater samples collected during the September/October 2001 groundwater sampling event are summarized in Tables 4 and 5, and are compared to previous push probe boring results in Tables 6 and 7. The laboratory reports and chain-of-custody documentation for September/October 2001 groundwater sampling event are included in Appendix E.

6. Results and Discussion

6.1 Subsurface Conditions

The geologic units of interest at and in the vicinity of the Site were previously discussed in the RI report (HAI 2001a). Generally, as indicated in the Preliminary Assessment⁷, much of the property has been extensively filled-in through time with mixtures of gravel, sand, silty sand, and silt. Fill materials were observed in all monitoring well borings to the maximum depth of investigation at 34.5 feet bgs similar to what was encountered in push probe borings during RI activities.

What appeared to be sand, silty sand, and silt fill was encountered to the maximum depth (up to 34.5 feet bgs) in all monitoring well borings, with the exception of MW-6 where predominantly gravel fill was encountered to a depth of approximately 20 feet bgs.

⁷ Port of Portland (2000). Preliminary Assessment, Port of Portland Terminal 1, 2200 NW Front Street, Portland, Oregon, 97209. September 18, 2000.

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6.2 Site Hydrogeology

On September 28 and October 30, 2001, groundwater was encountered in the monitoring wells at depths ranging from 18.5 feet (MW-1) to 29.3 (MW-7) feet below top of casing, or elevations of 4.1 to 11.9 feet mean sea level (msl)(Table 2)

Groundwater elevations on September 28 and October 30, 2001, indicate a general flow to the northeast towards the Willamette River with a decline or even reversal of the gradient near the river (Figure 4). Groundwater elevations at MW-5 appear to be anomalously high, possibly due to river wall construction in this area.

6.3 Screening Levels

Soil and groundwater analytical testing results were compared to risk-based screening levels (RBSLs) to screen for potential risks to human health and ecological receptors. U.S. Environmental Protection Agency (EPA) Region 9 Preliminary Remediation Goals (PRGs) were used as RBSLs for human health. Since the surrounding area is commercial and residential, and the future contemplated land use of the Site is commercial and residential, Site soil and groundwater impacts were compared to residential PRGs.

Additionally, DEQ Ecological Benchmark Screening Levels (EBSLs), where established, were utilized to screen groundwater results for a preliminary risk evaluation of the "groundwater to surface water pathway".

6.4 Soil Sampling Results

Field screening of soil samples from the monitoring well borings did not indicate the presence of possible soil contamination with the exception of samples at 30 feet bgs in MW-1 and at depths of 4.5 to 11.0 feet bgs in MW-6, which displayed slight sheen but no odor or discoloration. Otherwise, evidence of soil contamination was not observed at other depths or well borings.

One soil sample was selected for laboratory analysis at MW-6 (5 feet bgs) to assess this well location for its representativeness as a background groundwater quality monitoring well. Soil samples were not collected from the MW-1 boring since this area had previously been extensively characterized during the RI activities.

The analytical testing of the soil sample collected at 5.0 feet bgs at MW-6 did not detect diesel- and/or oil-range petroleum hydrocarbons, VOCs, or PAHs above laboratory reporting limits (Table 3). Various metals were detected above reporting limits; however, only arsenic, detected at a concentration of 3.37 ppm, exceeded its PRG screening level of 0.39 ppm. However, the MW-6 soil sample arsenic concentration is below the background level of 5.3 ppm for arsenic, established in the RI (HAI 2001a). Accordingly, the arsenic detected in the MW-6 boring is attributed to naturally occurring background concentrations. Further, where reference values are available, all other concentrations of

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metals are within the range of naturally occurring background concentrations. It appears that the location of MW-6 is suitable for evaluating background groundwater quality at the site.

6.5 Groundwater Sampling Results

The groundwater sampling program followed a sampling and analysis plan (Table 8) designed to address the following four objectives:

- 1) Validate push probe boring data and further determine the magnitude of impacts to groundwater
- 2) Establish a background groundwater monitoring well, if possible
- 3) Collect groundwater data suitable for evaluating the "groundwater to surface water pathway" at the site
- 4) Collect groundwater data of sufficient quality to support a risk assessment.

6.5.1 Groundwater Analytical Testing Results

The groundwater results are summarized below and on Tables 4 and 5.

- Diesel-range or oil-range petroleum hydrocarbons were not detected above laboratory reporting limits in groundwater at MW-4 (B-37 Area). Oil-range petroleum hydrocarbons were not detected above laboratory reporting limits at MW-1 (B-38 Area), but diesel-range petroleum hydrocarbons were detected at a concentration of 416 parts per billion (ppb). The diesel-range petroleum hydrocarbons detected at MW-1 are flagged in the analytical report as having non-petroleum peaks suggesting the presence of biogenic interference (e.g., organic matter within the fill). This suggests the detected concentrations of diesel-range petroleum hydrocarbons in groundwater at MW-1 may be an overestimate of actual groundwater quality.
- Benzene, toluene, ethylbenzene, and xylene (BTEX) compounds were not detected in primary source area monitoring wells MW-1 (B-38 Area) or MW-4 (B-37 Area).
- One halogenated VOC, tetrachloroethene (PCE), was detected in MW-1 at a
 concentration of 3.29 ppb, which exceeds the EPA PRG of 1.1 ppb for tap water. This is
 the first detection of any halogenated VOC at the Terminal 1 South site. The source of
 the detected PCE is likely from an up-gradient off-site source.
- PAHs were present at low concentrations (less than 2.1 ppb total PAHs) in five of seven
 monitoring wells (MW-2, MW-3, MW-4, MW-5, and MW-7) (Table 5, Figure 5).
 The detected PAHs, all non-carcinogenic, were present at concentrations below both
 RBSLs and EBSLs. PAHs were not detected above laboratory reporting limits at
 MW-1 (B-38 Area) or MW-6.

- DEHP was not detected above laboratory reporting limits in MW-1, MW-2, MW-6, or MW-7. DEHP results are further discussed in section 6.5.3.
- Of the nine total (unfiltered) metals analyzed (Table 4), arsenic at all well locations, and lead at one location (MW-3), were detected in groundwater at concentrations above RBSLs for tap water. Concentrations of total arsenic ranged from 1.06 to 14 ppb, exceeding the EPA PRG for tap water of 0.045 ppb. Although there is no PRG established for lead in groundwater, lead at MW-3 was detected at a concentration of 36.2 ppb, which is above the Safe Drinking Water Act (SDWA) action level of 15 ppb. Total lead at MW-3 and MW-7 was detected at concentrations of 36.2 and 4.47 ppb, respectively, above the EBSL of 3.2 ppb. In addition, total copper at MW-3 detected at a concentration of 40.2 ppb exceeded an EBSL of 12 ppb.
- Analysis of dissolved (filtered) arsenic, copper, and lead was conducted at all well
 locations. The filtered concentrations of arsenic remained largely unchanged from
 unfiltered concentrations at all wells. A reduction of arsenic to non-detect levels
 was observed in the filtered samples at MW-1 and MW-7. Concentrations of copper
 and lead were reduced to non-detect levels in the filtered samples with the exception
 of MW-1. It is assumed the filtered groundwater samples are more representative of
 actual groundwater quality at the Site than unfiltered samples.

In summary, the results of the groundwater sampling at the monitoring wells indicates only four chemicals were found at concentrations that exceed RBSLs and/or EBSLs: arsenic, copper, lead, and PCE. Copper and lead concentrations dropped to below RBSLs and EBSLs in filtered samples. PAHs, although detected at most wells at the site, were found at concentrations well below RBSLs and EBSLs. The source of PCE detected in MW-1 is likely from an up-gradient off-site source. Arsenic may be attributed to naturally occurring background conditions.

6.5.2 Monitoring Well - Push Probe Comparison

The analytical results at six monitoring well/push probe pairs, MW-1/B-38/39, MW-2/B-77, MW-3/B-105, MW-4/B-87, MW-6/GW-1, and MW-7/GW-4, were compared to assess for trends between screening level push probe groundwater sample results versus monitoring well sample results (Tables 6 and 7). A push probe boring counterpart was not present in near proximity of MW-5 for comparison.

In general, PAH concentrations are lower or not detected in the monitoring well samples, as compared to their counterpart push probe samples, on both a constituent and total basis. Most significant, was the reduction of carcinogenic PAHs in push probe samples to non-detectable levels in the groundwater samples. The greatest difference in PAH concentrations was found at MW-4 versus B-87 for total PAHs, 32.3 ppb to 1.7 ppb respectively. Similarly, in general lower dissolved arsenic, copper, and lead concentrations were observed in the monitoring well samples compared to the push probe groundwater samples.

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The comparison of push probe versus monitoring well groundwater samples at T1S indicate that the push probe sampling data overestimated PAH and metals concentrations in groundwater. The push probe methodology for collecting screening-level groundwater samples will typically result in more turbid samples containing suspended and colloidal material that may contain contaminants.

The most significant observation is that carcinogenic PAHs in push probe samples, which exceeded RBSLs and EBSLs, were not detected in the monitoring well samples. Therefore, PAHs are not contaminants of concern in groundwater at T1S.

DEHP was previously detected in screening-level groundwater samples from push probes at B-39, GW-1, and GW-4, but was not detected in monitoring well counterparts MW-1, MW-6, or MW-7. This information indicates DEHP is not present in the groundwater at the site, and its presence in some screening-level groundwater samples was from either laboratory and/or equipment contamination. DEHP no longer appears to be a contaminant of interest at the Site, and can be eliminated from further analysis.

6.5.3 Background Groundwater Conditions

Based on its location, MW-6 appears to be the best candidate for a background monitoring well at the Site. Analytical testing of the groundwater sample from MW-6 did not detect PAHs or DEHP above laboratory reporting limits. Of four total (unfiltered) metals analyzed, arsenic and lead were detected at concentrations of 2.72 and 2.51 ppb; copper was not detected above laboratory reporting limits. The concentration of arsenic of 2.72 ppb exceeds its RBSL of 0.045 ppb. There is no PRG established for lead in groundwater; however, the lead detected at a concentration of 4.47 ppb is below the Safe Drinking Water Act (SDWA) action level of 15 ppb. The detected concentrations of arsenic and lead in groundwater at the Site are within background concentrations for an uppermost water-bearing zone for this area. It appears the location of MW-6 may be used to assess baseline groundwater quality at the Site.

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6.5.4 Groundwater Quality Data Validation

The analytical data collected by HAI for the groundwater sampling conducted in September and October 2001 was assessed to ensure that it is of acceptable quality. The analytical data was subjected to a review of all field and laboratory quality assurance/quality control (QA/QC) measures.

A review of the groundwater QA/QC data is summarized below:

- All samples were analyzed within appropriate holding times.
- All samples showed acceptable surrogate recoveries with one exception as described below.
- No contaminants were detected in laboratory method blanks.
- Equipment calibration and laboratory control standards (LCS) were within acceptable ranges.
- All matrix spike (MS) and matrix spike duplicate (MSD) recoveries were within acceptable ranges.
- All continuing calibration verification (CCV) standards were within acceptable limits.
- All MS/MSD relative percent differences (RPD) were within acceptable limits.
- All laboratory batch sample duplicates showed acceptable RPDs, with one exception described below.
- The field groundwater duplicate sample collected from MW-1 was within a RPD of 21% for TPH, 18% for PCE, and 62% for arsenic; all other metals were below an RPD of 23% (zinc).
- The equipment blank did not detect VOCs or DEHP above method detection limits.

Data qualifiers identified in the laboratory analytical reports are described in detail to assess their impact on groundwater data quality.

NCA Report No. P1J0097, Page 2 of 31 (Appendix D): Concentrations of diesel-range organics in sample no. 5106-011001-108 and no. 5106-011001-109 were flagged "D-15" indicating the detected hydrocarbons have non-petroleum peaks suggesting the presence of biogenic interference. The results suggest the detected diesel-range organics may be an overestimate, if present, in the sample.

NCA Report No. P1J0097, Page 14 of 31 (Appendix D): Surrogate recoveries for sample no. 5106-011001-109 were flagged "A-10" and "S-08" indicating actual surrogate recoveries were believed to be one-half the reported values, and that the surrogate recovery was above control limits. However, since no analytes were detected in the sample, the quality of the data has not been affected.

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NCA Report No. P1J0097, Page 20 of 31 and NCA Report No. P1J0098, Page 16 of 27 (Appendix D): The batch sample duplicate for copper and lead were flagged "Q-06" since the RPDs exceeded the RPD limit of 20. Although the RPD between the sample result and duplicate result was greater than 20, the original result was less than five times the laboratory reporting level, therefore the RPD is not applicable and the batch analysis remains valid for this compound.

Based on the QA/QC review, it appears the data collected during the September/October 2001 sampling event are of sufficient quality for groundwater quality assessment purposes. There are circumstances where groundwater detection limits are above risk-screening levels or ecological benchmark values due to industry standard method capabilities. Accordingly, this data will be evaluated by alternative means in the risk assessment as described in the Risk Assessment Work Plan⁸.

6.5.5 Revised Groundwater Monitoring and Analysis Plan

Based on the groundwater analytical results, an updated groundwater monitoring and analysis plan is presented in Table 8. The revised plan includes additional analysis of groundwater for VOCs at MW-1, MW-2, and MW-3; a trip blank for VOCs is also proposed. The revised plan eliminates further analysis at MW-4 for TPH and VOCs since the September/October 2001 sampling event did not detect these compounds. Since the presence of DEHP in screening level groundwater samples has been attributed to either laboratory and/or equipment contamination, it has been eliminated from further testing. Analysis for PAHs, unfiltered and filtered arsenic, copper, and lead, and total suspended solids will be conducted at each of the seven monitoring wells. The next groundwater sampling event is scheduled for January 2002.

6.6 Supplemental Water Well Beneficial Use Research

The DEQ requested further research relating to six water wells identified in the RI report (HAI 2001) that fell within a one-half mile radius of the Terminal 1 South Site. The status of each of the six wells was assessed by conducting additional research and interviews of property owners and/or managers (Appendix F). Property owners and/or facility managers were identified for Wells 1 through 5. Of those five wells, none were reported to be in use. The location and/or use of Well 6 installed for the "Ice Coliseum" could not be determined. The reported location of Well 6 is in Section 33, which places this well at least 1,000 feet up-gradient of the Site.

⁸ Hart Crowser, Inc. (2001). Risk Assessment Work Plan, Marine Terminal 1 South, 2100 NW Front Avenue, Portland, Oregon. September 14, 2001.

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7. Conclusions

Monitoring well installation and groundwater sampling activities were conducted at the Terminal 1 South property in September and October 2001. Groundwater samples were collected from all seven monitoring wells that were installed at the site.

The subsurface soils encountered during the monitoring well installation were predominantly sands and silts with occasional gravel fill to the maximum depth of investigation of 34.5 feet bgs. Groundwater elevations in six of seven monitoring wells in September and October 2001 indicate a general groundwater flow directions towards the Willamette River. Groundwater elevations at MW-5 appear anomalously high, possibly due to sea wall construction.

The groundwater sampling results at the seven monitoring wells indicate that only four chemicals were found at concentrations that exceed RBSLs and/or EBSLs: arsenic, copper, lead, and PCE. Copper and lead concentrations in groundwater dropped to below RBSLs and EBSLs in filtered samples. The source of the PCE detected in groundwater at MW-1 is likely from an up-gradient, off-site source. PAHs were found at concentrations well below RBSLs and EBSLs. Arsenic may be attributed to naturally occurring background conditions.

The comparison of groundwater samples at six monitoring well/push probe pairs indicate PAH concentrations are consistently lower or not detected in monitoring well groundwater samples as compared to push probe samples. Significantly, carcinogenic PAH concentrations in RI push probe groundwater samples which exceeded RBSLs and EBSLs, were not detected in the monitoring well samples. Therefore, PAHs are not contaminants of concern in groundwater at TIS. Also, lower dissolved arsenic, copper, and lead concentrations were generally observed in the monitoring well samples compared to the push probe groundwater samples.

Based on the groundwater sampling results, a revised groundwater sampling plan was developed for the next groundwater sampling event.

8. Limitations

The samples discussed in this report were collected, analyzed, and interpreted following the standards of care, skill, and diligence ordinarily provided by a professional in the performance of similar services as of the time the services were performed. This report and the conclusions and/or recommendations contained in it are based solely upon physical sampling and analytical activities that were conducted. The data presented in this report document only the concentrations of the target analytes in the particular sample and not the property as a whole.

If there are any comments or questions, please contact the undersigned. Thank you for the opportunity to be of service.

Sincerely,

Guy H. Tanz, R.G. Associate

GLOSSARY OF ABBREVIATIONS

VOCS

below existing ground surface bgs BTEX benzene, toluene, ethylbenzene, xylene COI contaminant of interest contaminants of potential concern **COPCs DEHP** Bis(2-ethylhexyl)phthalate **EBSL** ecological risk-based screening level ESA environmental site assessment **EPA** U.S. Environmental Protection Agency FS feasibility study HAI Hahn and Associates, Inc. HCID hydrocarbon identification LOF locality of facility Maul Foster Maul Foster and Alongi, Inc. msl mean sea level N W northwest Oregon Administrative Rules OAR DEQ Oregon Department of Environmental Quality OWRD Oregon Water Resources Department **PAHs** polynuclear aromatic hydrocarbons Port the Port of Portland ppb parts per billion parts per million ppm **PRGs** EPA Region 9 Preliminary Remedial Goals **RBSL** risk-based screening level RIremedial investigation **SVOCs** semi-volatile organic compounds TPH total petroleum hydrocarbons ug/l micrograms per liter (ppb) VCP Voluntary Cleanup Program

volatile organic compounds

TABLE 1 - Monitoring Well Construction Summary

Monitoring Well Installation and Groundwater Sampling Port of Portland Terminal 1 South 2100 NW Front Avenue Portland, Oregon

Project No. 5106

			Contractor	Date Installed	Installation Method	Well Diameter (inches)	Screen Type	Slot Size		Ground Surface Elevation (feet msl)	Top of Casing Elevation (feet msl)	Boring Depth (feet bgs)	Screen Length (feet)		Elevation		Groundwater Elevation 10/30/01 (feet mal)	
MW-1	L51482		GeoTech Explorations	28-Aug-01	Hollow-Stem Auger	2	Slotted PVC	0.010	10-20	30.68	30.39	33.5	15.0	17 - 32	13.7	-1.3	11.73	/,
MW-2	L51483	1352 4 5	GeoTech Explorations	28-Aug-01	Hollow-Stem Auger	2	Slotted PVC	0.010	10-20	28.45	28.16	33.0	15.0	17 - 32	11.5	-3.6	4.05	17
MW-3	L51484	135246	GeoTech Explorations	28-Aug-01	Hollow-Stem Auger	2	Slotted PVC	0.010	10-20	27.97	27.56	33.0	15.0	17 - 32	11.0	-4.0	4.13	2 3
MW-4	L51480	135242	GeoTech Explorations	27-Aug-01	Hollow-Stem Auger	2	Slotted PVC	0.010	10-20	30.25	29.84	32.0	15.0	17 - 32	13.3	-1.8	4.84	ء ،
MW-5	L51486		GeoTech Explorations	29-Aug-01	Hollow-Stem Auger	2	Slotted PVC	0.010	10-20	33.23	33.04	34.5	15.0	19 - 34	14.2	-0.8	6.09	27
MW-6	L51481	135243	GeoTech Explorations	28-Aug-01	Hollow-Stem Auger	2	Slotted PVC	0.010	10-20	30.62	30.25	32.0	15.0	17 - 32	13.6	-1.4	7.88	22
MW-7	L51485	135247	GeoTech Explorations	29-Aug-01	Hollow-Stem Auger	2	Slotted PVC	0.010	10-20	33.76	33.51	33.0	15.0	17 - 32	16.8	1.8	4.62	28

bgs = below ground surface

msl = mean sea level

OWRD = Oregon Department of Water Resources

PVC = polyvinyl chloride

TABLE 2

Summary of Water Level Measurements and Elevations

Monitoring Well Installation and Groundwater Sampling Port of Portland Marine Terminal 1 South 2100 NW Front Avenue Portland, Oregon

HAI Project No. 5106

Elevation of Top of Casing

Survey Date				ion of Top of (feet msl)	Casing		
	MW-i	MW-2	MW-3	∞MW-4	MW-5	MW-6	MW-7
10-Sep-01	30.39	28.16	27.56	29.84	33.04	30.25	33.51

Measured Water Level

Date Measured			Meas	sured Water (feet btc)	Level:		
	MW-1	MW-2 \$	MW-3	MW-4	MW-5	MW-6	WW-7
28-Sep-01	18.53	23.97	23.46	24.93	26.96	22.41	29.25
30-Oct-01	18.66	24.11	23.43	25.00	26.95	22.37	28.89

Elevation Data

Date/Time Measured				ndwater Elev (feet msl) ⁱ	ation		
	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7
28-Sep-01	11.86	4.19	4.10	4.91	6.08	7.84	4.26
30-Oct-01	11.73	4.05	4.13	4.84	6.09	7.88	4.62

NOTE:

btc - below top of casing

msl = mean sea level

1 = City of Portland datum

TABLE 3 - Summary of Analytical Results for Soil Sample

Monitoring Well Installation and Groundwater Sampling Port of Portland Terminal 1 South 2100 NW Front Avenue

Portland, Oregon

Project No. 5106

Analytical Methods and	Analytical Results	Reference Levels
Parameters	mg/kg (ppm)	mg/kg (ppm)
Boring Number ==	> MW-6	EPA PRG for
Sample Depth (feet bgs) ==	5.0	Residential Soil
Sample Number ==	5106-010928-004	
Sample Date ==		
Northwest Method TPH-Dx		-
Diesel-Range TPH	ND>25	-
Oil-Range TPH	ND>50	
PAHs by EPA 8270	ND>0.0268	-
VOCs by EPA Method 8260B	ND	-
Total Metals by EPA 6010		
Antimony	ND>0.5	31.
Arsenic	3.37	0.39
Beryllium	ND>0.5	150.
Cadmium	ND>0.5	37.
Chromium	15.8	210.
Copper	17.8	2,900.
Lead	20.4	400.
Mercury	ND>0.1	23.
Nickel	19.3	1,600.
Selenium	ND>0.5	390.
Silver	ND>0.5	390.
Thallium	ND>0.5	5.2
Zinc	50.9	23,000.

Note:

bgs = below ground surface

DEQ = Oregon Department of Environmental Quality

EPA = U.S. Environmental Protection Agency

mg/kg = milligrams/kilogram

ND = not detected

PAHs = polynuclear aromatic hydrocarbons

ppm = parts per million

PRG = EPA Region 9 Preliminary Remediation Goal

TPH = total petroleum hydrocarbons VOCs = volatile organic compounds

Bold = Concentration in excess of reference level

Updated: 12/10/01 GHT File Name: 5106-03 Soil Rslts

Page 1 of 1 HAHN AND ASSOCIATES, INC.

TABLE 4 - Summary of Analytical Results for Groundwater Samples Monitoring Well Installation and Groundwater Sampling Port of Portland Marine Terminal 1 South

2100 NW Front Avenue

Portland, Oregon

Portland, Oregon																									P	roject No. 5106
Boring	Screen	Sample	Sample :		: :		V 16	i		- 4	11.17		A	nalytical	Results	ug/l (pp	ь)	·)	1,1		7 %	100		77.		
Number	Interval	Number	Date	rw t	PH-Dz		v	Ce by EP	Method &	3260B	us Santa e un	EPA Me	thod 8270				Total an	d Diesolved	Metals by	EPA Meti	hod 60107	1000 Series				EPA Method 160.1
	(feat bgs)			Diesel-Range	Oil-Range	Benzeno	Toluene	Ethylbensene	Total Xylenes	Naphthalene	Other VOCs	Total PAHs (Table 5)	овню	Arvenic	Arsenic (filtered)	Cadmium	Chromium	Copper	Copper (filtered)	Lead	Lead (filtered)	Mercury	Nickel	Silver	Zine	Total Suspended Solids
MW-1	17 - 32	5106-011001-108	1-Oct-01	416.	ND>500	ND>t	ND>1	ND>1	ND>2	NO>2	PCE=2.76	ND	ND>10	3.01	ND>1	ND>1	3.25	4.74	2.29	1.16	1.37	ND>0.2	5.25	ND>1	10.6	36.
MW-1 (duplicate)	17 - 32	5106-011001-109	1-Oct-01	338	ND>500	ND>1	ND>1	ND>1	ND>2	ND>2	PCE=3.29	ND	ND>10	1.06	ND>1	ND>1	2.65	3.88	2.03	ND>1	ND>1	ND>0.2	4.49	ND>1	8,43	35
MW-2	17 - 32	5106-011001-107	1-Oct-01	:].				2.1	ND>10	12.8	14.5	Ī		ND>2	ND>3		ND>1			<u> </u>		55
MW-3	17 - 32	5106-010928-103	28-Sep-01		-			ļ				0.3		14.	11.	Ţ		40.2	ND>2	36.3	ND>1	ļ				720.
MW-4	17 - 32	5106-010928-104	28-Sep-01	ND>250	ND>500	ND>1	ND>1	ND>1	ND>2	ND>2	ND	1.7		6.45	6.51	ND>1	5.12	4.48	ND>2	2.49	ND>L	ND>0.2	3.86	ND>1	9.06	130.
MW-5	19 - 34	5106-010928-102	28-Sep-01	-	-].	.	. !	ļ.·	1.8	-	12.1	11.3	Ţ		2,95	ND>2	1.46	ND>1	<u> </u>	<u>. </u>	<u>. </u>		108.
MW-6	17 - 32	5106-010928-105	28-Sep-01									ND	ND>10	2.72	8,65			2.51	ND>2	ND>1	ND>1].].		11.6	60.
MW-7	17 - 32	5106-011001-106	1-Oet-01		-		[-	-	0.3	ND>10	1.38	ND>1			ND>2	ND>2	4.47	ND>1					ND>20
Equipment Blank		5106-011001-110	1-Oct-01		[.	ND>1	ND>1	ND>1	ND>2	ND>2	מא		ND>10	Ţ	-					-].	<u>. </u>].		
		EPA PRG for T	ap Water ->			0.35	720.	1,300.	1,400	6.2	PCE=1.1		4.8	0.045	0.045	18.	110.	1,400.	1,400.	15.1	15.1	11.	730,	150.	11,000.	-
DEQ Eco	logical Level I	I Screening Beachm				130.	9.8	7.3	1.8	620.	PCE=240		3.	48.	48.	1.1	11.	12.	12.	3.2	3.2	0.012	160.	0.12	110.	

Note:

bgs a below ground surface DRHP = bis(2-othythoxyl)phthalato EPA = U.S. Environmental Protection Agency

ND = not detected above datection limit indicated DEQ = Oregon Department of Environmental Quality PAHs = polynuclear aromatic hydrocarbons PCE = tetrachlorothene
ppb = parts per billion
PRG = EPA Region 9 Preliminary Remodiation Goal (11/00)

TPH = total patreleum hydrocarbons ug/l = micrograms per liter VOCs = volatile organic compounds

1 a EPA Primary Drinking Water Regulation action level

2 - The hydrocarbon pattern suggests biogenic interference

Bold - Concontration in excess of EPA PRG for tap water

Shaded = Concentration in excess of Ecological Benchmark Screening Value

TABLE 5 - Summary of Analytical Results for Groundwater Samples: PAHs by EPA Method 8270

Monitoring Well Installation and Groundwater Sampling Port of Portland Marine Terminal 1 South 1100 NW Front Avenue Portland, Oregon

Project No. 5106

ortland, Oregon										_										oject No. 510
PARE by EPA Met	thod \$270 (S	1040		经 编数				المراجعة ال المراجعة المراجعة ال		电流	Analytica ug/l				ease dige		資料等にある 京大きな		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
	1800	5493574		4,54% 2	By Darty	Jakha J	Carcinog	enic PAHa		, P		沙 拉。	33.75		Non-Carcin	ogenic PAH.	1587 88			138.20
ontoring Well Number	reco Interval (feet hgs)	mple Number	mple Date	Spot (a) arthracene	nazo (a) pyrene	nno (b) fluorairthea	nzo (ghi) perytene	into (k) fluiranthese	consta	kino (sh) anthraces	dino (1,2,3-cd) pyrane	enaphthene	completiviero	thrucon	urmithere	The second secon	phthalene	enthrane *		idi PAB.
77. 3	. 38		San B	1 A	<u> </u>	3 8 2	8	a .	ੱਤ	- A	j		/,8 ⋅	\$ 22	Ē	Ē	Ž		·	2
rw-1	17 - 32	5106-011001-108	1-001	ND>0.1	1.0<0.1	ND>0.1	ND>0.1	1.0×DN	1.0<0N	ND>0.2	ND>0.1	ו.0<מא	ND>0.1	ו.0<0.	ND>0.1	1.0 <dn< td=""><td>ND>0.1</td><td>1.0<0 מא</td><td>ו.0<0.</td><td>ND</td></dn<>	ND>0.1	1.0<0 מא	ו.0<0.	ND
W.1 (Duplicate)	17 - 32	5106-011001-109	1-0:1-01	ND>0,1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.2	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	סמ
VW-2	17 - 32	5106-011001-107	1-Oct-01	ND>0.1	ND>0.1	ND>0.1	1.0 <dm< td=""><td>ND>0.1</td><td>ND>0.1</td><td>ND>0.2</td><td>ND>0.1</td><td>0.121</td><td>ND>0.1</td><td>ND>0.1</td><td>0.119</td><td>ND>0.1</td><td>ND>0.1</td><td>1 25</td><td>0.564</td><td>2.1</td></dm<>	ND>0.1	ND>0.1	ND>0.2	ND>0.1	0.121	ND>0.1	ND>0.1	0.119	ND>0.1	ND>0.1	1 25	0.564	2.1
KW-3	17 - 32	5106-010928-103	28-Sep-01	ND>0.1	ND>0.1	ND:0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.2	ND>0.1	0.192	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	0.138	ND>0.1	0.1
VW-4	17 - 32	5106-010928-104	28-Sep-01	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	NT)>0.2	1.0בתא	0.72	ND>0.1	ND>0.1	ND>0.1	ND>0.1	0.291	0.576	0.123	1.7
vw.s	19 - 34	5106-010928-102	28-Sep-01	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND=0.2	ND>0.1	0,448	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	1 16	0.172	1.6
NTW-6	17 - 32	5106-010928-105	28-Sep-01	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.2	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND
MTW-7	17 - 32	5106-011001-106	1-001-01	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.2	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	0.153	0.153	0.
	945 2000	EPA PRG for	Tap Water ->	0.092	0.0092	0.092		0.92	9.2	0.0092	0.092	370.	•	1,800.	1,500	240	6.2		180.	
DEQ Eco	logical Level	II Screening Bench	mark Value->	0.027	0.014		•		1 7/2 3			520		_	6 16	39	620.	6.3	•	

bgs = below ground surface

EPA = U.S. Environmental Protection Agency

ND w not detected above extection limit indicated

Bold = Concentration in excess of EPA PRG for tap water

Shaded - Concentration in excess of Ecological Benchmark Screening Value

DEQ = Oregon Department of Environmental Quality PAHa = polynucker erometic hydrocarbons ppb = parts per billion

PRG = EPA Region 9 Preliminary Remediation Coal (11/00)

ug/l = micrograms per liter

TABLE 6 - Summary of Analytical Results for Groundwater Samples: Monitoring Wells Versus Push Probes

Monitoring Well Installation and Groundwater Sampling

Port of Portland Marine Terminal 1 South 2100 NW Front Avenue

Portland, Oregon

Project No. 5106

Boring	Screen	Sample ;	Sample	14:1580 BA		克马勒姆斯		Analytical Res	ults ug/l (ppb) 小亚拉莫拉	\$4.1600 PM	中心医院的	国。中国中国		
Number	Interval	Number	Date		e e	PA Method 826	0B		EPA Met	hod 8270 🕍	Dissolved (fil	d (filtered) Metals by EPA Method 6000/7000 Series			
	(feat bgs)			Benzens	Toluene	Ethylbenzene	Total Xylenes	ர் Other VOCs	Total PAHs (Table 5)	DEHP	Arsenic	Copper	Lead		
MW-1	17 - 32	5106-011001-108	1-Oct-01	ND>1	ND>1	ND>1	ND>2	PCE = 2.76	ND	ND>10	ND>1	2.29	1.37		
MW-1 (duplicate)	17 - 32	5106-011001-109	1-Oct-01	ND>1	ND>1	ND>1	ND>2	PCE = 3.29		ND>10	ND>1	2.03	ND>1		
B-98 (GW-3)	23 - 27	4876-000301-105	1-Mar-00	ND>1	ND>1	ND>1	ND>2	ND	8.7	-	2.3	5.1	2.2		
B-39	26 - 30	4876-000313-010	13-Mar-00						ND	44.		·	-		
MW-2	17 - 32	5106-011001-107	1-Oct-01	-	. 1	<u> </u>	-		2.1	ND>10	14.5	ND>2	ND>1		
B-77	24 - 28	5106-000922-103	22-Sep-00	ND>1	ND>1	ND>1	ND>2	ND	6.	ND>10	ND51	1.07	ND>1		
MW-3	17 - 32	5106-010928-103	28-Sep-01	-	. :		-		0.3		11.	ND>2	ND>1		
B-105	22 - 26	5106-001026-108	30-Oct-00		-				1.3	-					
MW-4	17 - 32	5106-010928-104	28-Sep-01	ND>1	ND>1	ND>1	ND>1	ND	1.7	-	6.51	ND>2	ND>1		
B-87	20 - 24	5106-001025-103	25-Oct-00	ND>1	ND>1	ND>1	ND>2	ND	32.3	-					
MW-6	17 - 32	5106-010928-105	28-Sep-01		-			-	ND	ND>10	3.65	ND>2	ND>1		
GW-1	24 - 28	4876-000229-102	29-Feb-00	ND>1	ND>1	ND>1	ND>1	ND	ND	109.	3.5	ND>2	ND>1		
MW-7	17 - 32	5106-011001-106	1-Oct-01					_	0.3	ND>10	ND>1	ND>2	ND>1		
GW-4	24 - 28	4876-000302-107	2-Mar-00	ND>1	ND>1	ND>1	ND>1	ND	ND	38.	3.	ND>2	ND>1		
distribution of the second	Self-self-self-self-self-self-self-self-s	EPA PRG for I	ap Water>	0.35	720.	1,300	1,400.			4.8	0.048	1,400.	15. ¹		
DEQ Eco	logical Level I	I Screening Benchm	ark Value>	130.	9.8	7.3	1.8			3.	48.	12.	3.2		

Note:

bgs = below ground surface

DEHP = bis(2-ethylhexyl)phthalate

EPA = U.S. Environmental Protection Agency

ND = not detected above detection limit indicated

DEQ = Oregon Department of Environmental Quality

PAHs = polynuclear aromatic hydrocarbons
PCE = tetrschloroethene

FOE = terrectioroguler

ppb = parts per billion

PRG = EPA Region 9 Preliminary Remediation Goal (11/00)

ug/l = micrograms per liter

 $VOC_8 = volatile organic compounds$

1 = EPA Primary Drinking Water Regulation action level Bold = Concentration in excess of EPA PRG for tap water

Shaded - Concentration in excess of Ecological Benchmark Screening Value

Updated: 12/11/01 GHT File Name: *5106-04/5/6/7 GW Relts PRG HAHN AND ASSOCIATES, INC. Page 1 of 1

TABLE 7 - Summary of Analytical Results for Groundwater Samples: Monitoring Wolls Versus Push Probes - PAHs by EPA Method 6270

Monitoring Well Installation and Groundwater Sampling Port of Portland Marine Terminol 1 South 2100 NW Frant Avenue

Portland, Oregon

Project No. 5106

PAHs by EPA M	othod 8370 (1000					7. 7.	11 144 11. 11. 11. 11. 11. 11. 11. 11. 1			Analytics				S. Barrier		ì			
Monitoring Well Number	Screen Internal (Gest bgs) w	Semple Number	Simple Date	Botto (c) driftrateiro	Bein (a) pyran	Denzo (b) Audrá athenie	Carcinog ampliad (thi) orang	Deers (tr.) (Incremitedno	Chiyaene	Dibeaso (ah) anthracese	Indeno (1,2,9-cd) pyreno	Accusphibene	AcenaphtlyJeino	Anthracene	Non-carcin	ogenia PAHs	Nenthalene	Pheniuthreso	Рукая	Total PAHs
MW-1	17 - 32	5106-011001-108	1-Oct-01	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.2	ND>0.1	ND>0 1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.L	ND>0.1	ND
MW-1 (Dup)	17 - 32	5106-011001-109	1-0ct-01	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	NE>0.2	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0 1	ND>0.1	ND>0.1	ND>0.1	מא
B-38 (GW-3)	23-27	4876-000301-105	1-Mar-00	0.5	0.2	0.8	0.2	ND>0.1	I.	ND>0.1	ND>0.1	0.2	ND>0.1	1.7	0.4	ND>0.1	0.7	0.9	2.1	87
B-39	28-30	4876-000313-010	13-Mar-00	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	NT)>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND
MW-2	17 - 32	5106-011001-107	1-Oct-01	ND>0.1		ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.2	ND>0.1	0.121	ND>0.1	ND>0.L	0.119	ND>0.1	ND>0.1	1.25	0.564	2.1
B-77	24-28	5106-000922-109	22-Ѕер-00	0.456	0.31	0.197	0.179	0.274	0.459	ND>0.2	0.156	0.119	1.0cGN	0.319	1.26	0,291	ND>0.1	0.618	1.41	6.
WM-2	17 - 32	5106-010928-103	28-Sep-01	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.2	ND>0.1	0.192	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	0.138	ND>0.1	0.
B-105	22-26	6106-001026-108	30-Oct-00	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	0.84	ND>0.1	0.1	ND>0.1	ND>0.1	1.0 <cm< td=""><td>0.34</td><td>ND>0.1</td><td>1.8</td></cm<>	0.34	ND>0.1	1.8
MW-4	17 - 32	5106-010928-104	28-Sep-01	ND>0.1	ND+0.1	ND>0.I	ND>0.1	ND>0.1	ND>0.1	NTD>0.2	ND>0.1	0.73	ND>0.1	ND>0.1	1.0<0M	ND>0.t	0.291	0.576	0.123	1.7
B-87	20-24	5106-001025-103	25-Oct-00	2.15	2.05	1.17	1.33	1.34	2.31	ND>2.0	1.07	2.15	ND>1.0	1.48	4.54	ND>1.0	ND>1.0	6.87	5.87	32.
NW-6	17 - 32	5106-010928-105	28-Sep-01	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.2	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>10
GW-1	24-28	4876-000229-102	29-Feb-00	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10
MW-7	17 - 32	5106-011001-106	1-Oct-01	ND>0.1	NTD>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.L	ND>0.2	ND>0.1	ND>0.L	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	0.153	0,153	0.2
GW-4	24-28	4876-000302-107	2-Mar-00	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10
	:	EPA PRG for	Tap Water>	0.092	0,0092	0.092	*	0.92	9.2	0.0092	0.092	37 0.	•	1,800.	1,500.	240.	6.2	,	180.	
DEQ Eco	ological Level	II Screening Bench	mark Value>	0.027	0.014	•	•	•			•	520.	•	•	6.16	3.9	620.	6.3	•	*

= Reference level not established bgs = below ground surface

EPA = U.S. Environmental Protection Agency ND = not detected above detection limit indicated

DEQ = Oragon Department of Environmental Quality PAlls = polynucles: aromatic hydrocarbons
ppb = parts per billion

PRG = EPA Region S Preliminary Remediation Goal (1 1/00)

ug/l = micrograms per liter

Bold - Concentration in excess of EPA PRG for tap water

Shaded a Concentration in excess of Ecological Benchmark Screening Value

POPT1S601499

TABLE 8 - Updated Groundwater Monitoring Plan

Monitoring Well Installation and Groundwater Sampling Port of Portland Marine Terminal 1 South 2100 NW Front Avenue Portland, Oregon

HAI Project No. 5106

Moitoring Event ==>			September/(October 200	1 (completed)	w _e jiyê ji	i za andar		Januar	ry 2001 (up	coming)		
EPA Method ==>	8260B	TPH-Dx 3	8270 SIM	8270	6010/7000		160.1	8260B	TPH-Dx *	8270 SIM	8270	6010/7000		
Analyte ==>	VOCs	Diesel and Oil	PAHs	DEHP	Unfiltered Metals ¹	Filtered Metals ¹	TSS	VOCs	Diesel and Oil	PAHs	DEHP	Unfiltered Metals	Filtered Metals ¹	TSS
MW-1	х	х	х	Х	X ²	Х	Х	Х		X		х	Х	х
MW-2			Х	X	Х	Х	X	X		X		Х	Х	Х
MW-3			Х		<u>x</u> .	x	х	X		X		х	х	х
MW-4	x	х	х		Xi	х	Х			X		х	х	х
MW-5			X		х	х	x			X		· x	х	х
MW-6 (background)			х	х	х	Х	X			. X		x	х	х
MW-7			х	х	х	х	X			. X		х	х	X
Duplicate	MW-1	MW-1	MW-1	MW-1	MW-12	MW-1	MW-1	MW-1		MW-2		MW-2	MW-2	MW-2
Equipment Blank	х			х				х		х	-			
Trip Blank								х						
Total Samples ==>	4	3	8	6	8 ;	8	8	. 6	0	9	. 0	8	8	8

NOTE:

1 = arsenic, copper, lead

2 = cadmium, chromium, mercury, nickel, silver, and zinc

3 = by Northwest Method

X = Collect and analyze for indicated analyte

DEHP = bis(2ethylhexyl)phthalate

EPA = U. S. Environmental Protection Agency

PAHs = polynuclear aromatic hydrocarbons

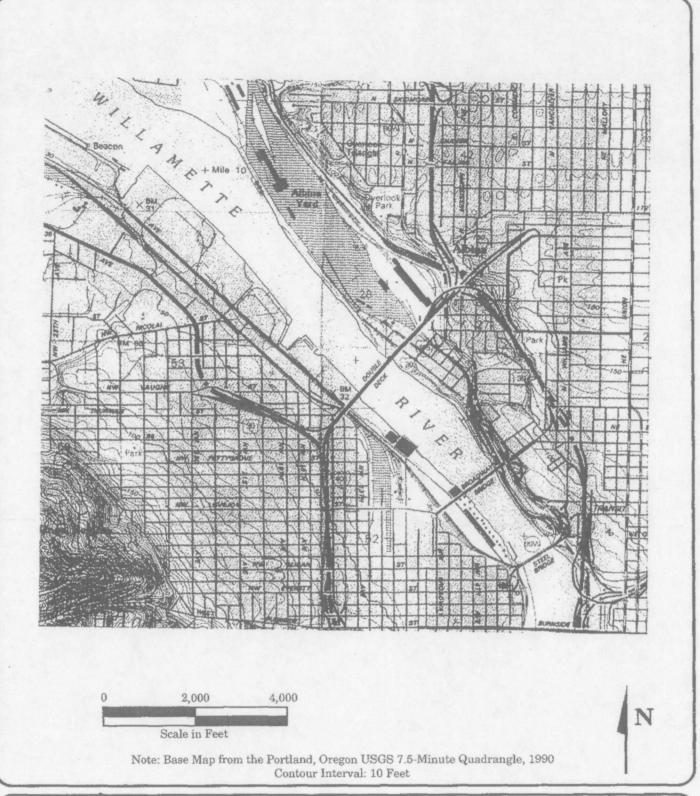
TPH = total petroleum hydrocarbons

TSS = total suspended solids

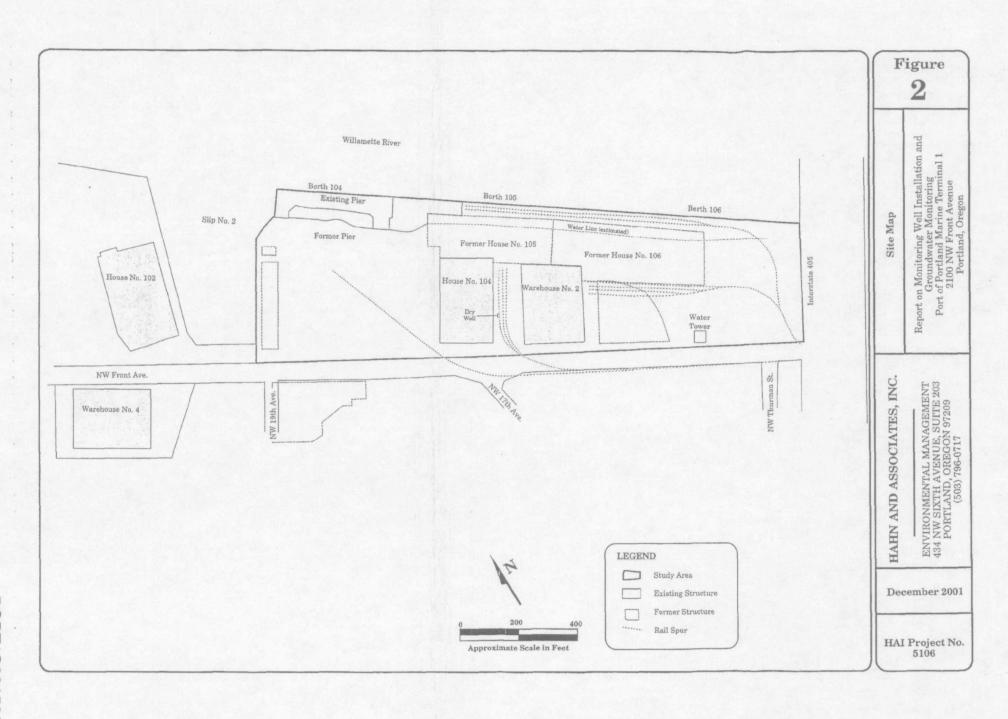
VOCs = volatile organic compounds

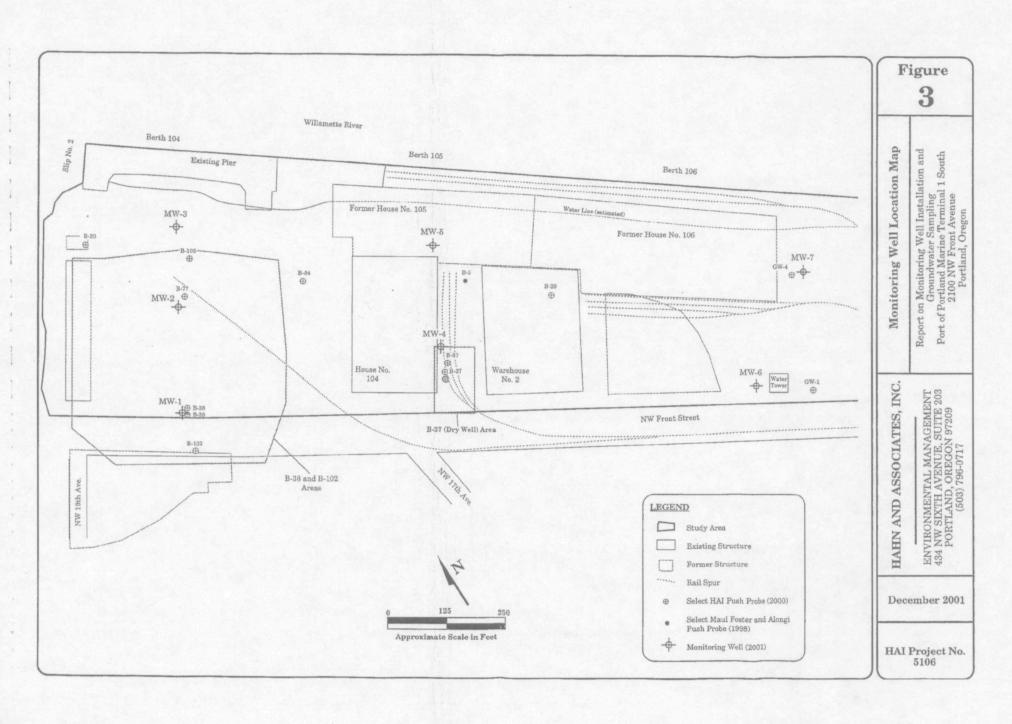
Updated: 12/19/01 GHT File: 5106-08 Plan update.xls

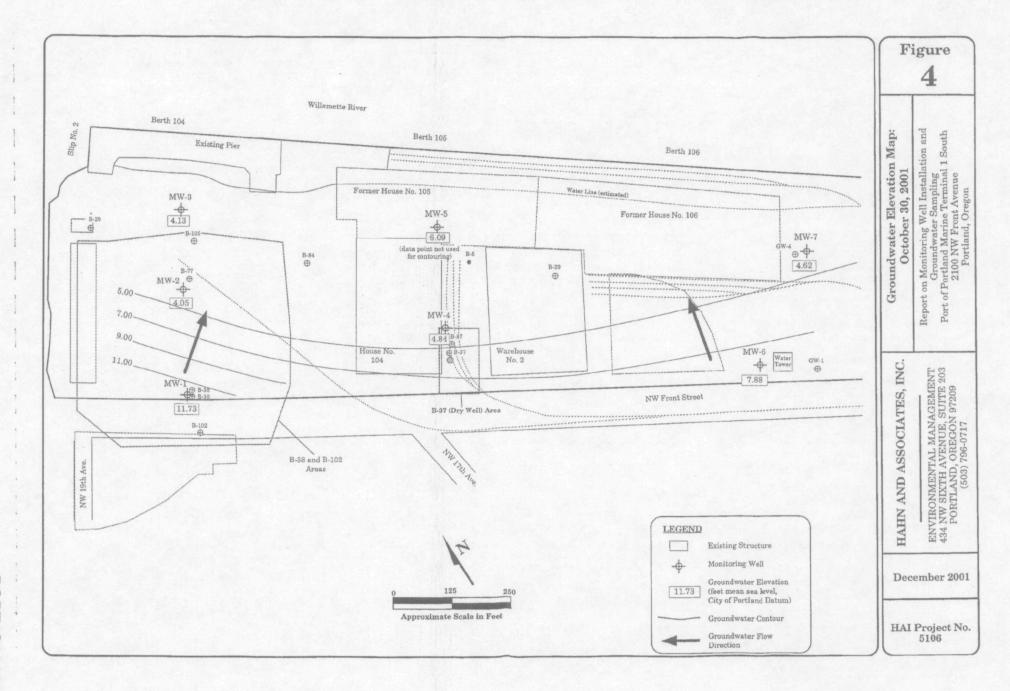
FIGURES

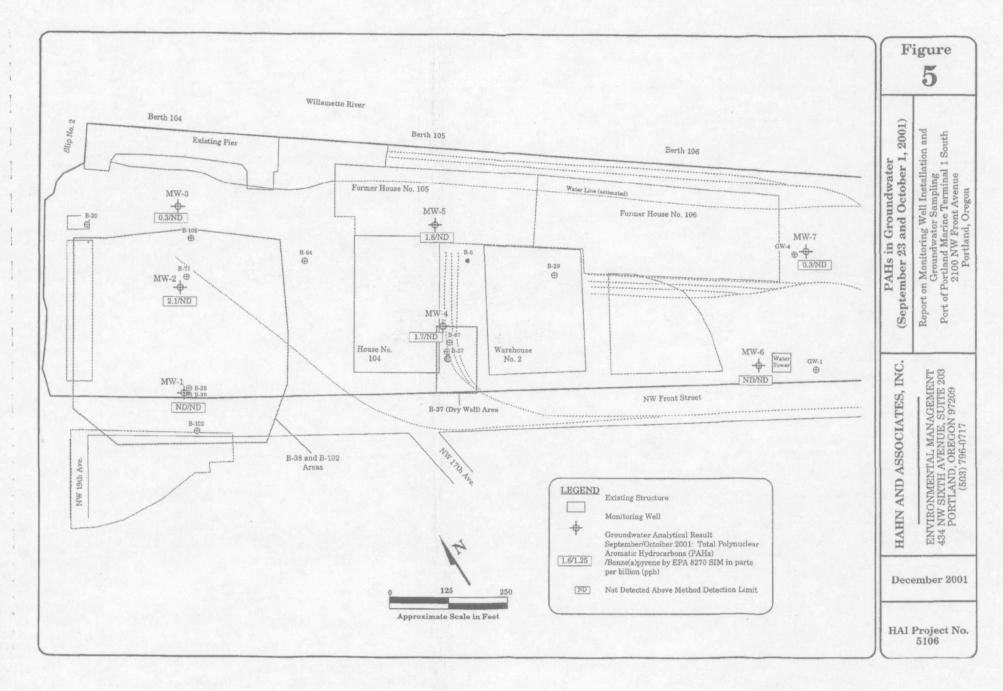


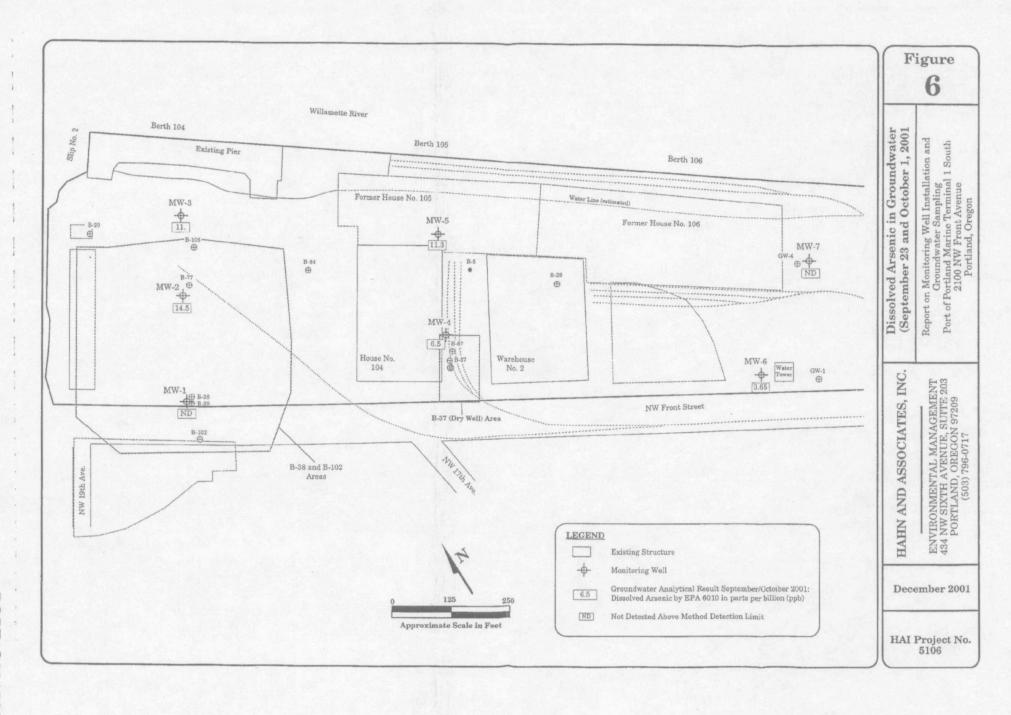
	HAHN AND ASSOCIATES	Location Map	FIGURE	
No. 5106	INCORPORATED	Monitoring Well Installation		
December 2001	ENVIRONMENTAL MANAGEMENT 434 NW SIXTH AVENUE, SUITE 203 PORTLAND, OREGON 97209 503/796-0717	and Groundwater Sampling Port of Portland Marine Terminal 1 South 2100 NW Front Avenue Portland, Oregon	1	











APPENDICES

APPENDIX A

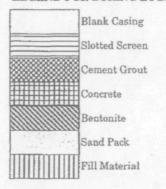
Monitoring Well Construction Logs

KEY TO BORING LOGS

Soil classification in this report is based upon visual and manual field observations which include moisture, consistency, plasticity and grading estimates and should not be construed to imply field or laboratory testing unless presented herein. Soils are classified in accordance with the Unified Soil Classification System. Stratigraphic boundaries are approximate representations only. No warranty is provided as to the continuity of soil strata between borings.

	MAJOR DIVISIO	NG	GROITE	SYMBOLS	TYPICAL NAMES
	WASON DIVISIO	140	GROOT	SIMBOLS	111 TOAL NAMES
	GRAVELS	Clean Gravels With Little or	GW		Well Graded Gravels, Gravel-Sand Mixtures
COURSE GRAINED	More Than Half the Course Fraction is	No Fines	GP		Poorly Graded Gravels, Gravel-Sand Mixtures
SOILS	Larger Than No. 4 Sieve Size	Gravels With Over 12% Fines	GM		Silty Gravels, Poorly Graded Gravel-Sand-Silt Mixtures
			GC		Clayey Gravels, Poorly Graded Gravel-Sand-Clay Mixtures
#200 Sieve Mot Co	SANDS	Clean Sands With Little or	sw		Well Graded Sands, Gravelly Sands
Larger Than #200 Sieve	More Than Half the Course Fraction is	No Fines	SP		Poorly Graded Sands, Gravelly Sands
	Smaller Than No. 4 Sieve Size	Sands With Over 12% Fines	SM		Silty Sands, Poorly Graded Sand-Silt Mixtures
			sc		Clayey Sands, Poorly Graded Sand-Clay Mixtures
	SILTS AN	D CLAYS	ML		Inorganic Silts and Very Fine Sands, Rock Flour, Silty or Clayey Fine Sands, or Clayey Silts with Slight Plasticity
FINE GRAINED	Liquid Limit I	ess Than 50%	CL		Inorganic Clays of Low to Medium Plasticity, Gravelly Clays Sandy Clays, Silty Clays, Lean Clays
SOILS			OL		Organic Clays and Organic Silty Clays of Low Plasticity
More Than Half is	SILTS AN	D CLAYS	МН		Inorganic Silts, Micaceous or Diatomaceous Fine Sandy or Silty Soils, Elastic Silts
Smaller Than #200 Sieve	Liquid Limit Gr	eater Than 50%	СН		Inorganic Clays of High Plasticity, Fat Clays
			ОН		Organic Clays of Medium to High Plasticity, Organic Silts
	HIGHLY ORGANIC	COTT	Pt		Peat and Other Highly Organic Soils

LEGEND FOR BORING LOGS



ABBREVIATIONS

NA	Not Applicable
ND	Not Detected Above Detection Limit
NS	Not Sampled
TPH	Total Petroleum Hydrocarbons
ppm	Parts Per Million
SPT	Standard Penetration Test
∇	Measured Static Water Level in Well
_	Estimated Water Level During Drilling

Updated: 12/10/01 File: 5106 Boring Log Key HAHN AND ASSOCIATES, INC. Project No. 5106

		AND A Sixth			S, INC.		MO	NI	FC	D	IN	G WELL NUMBER MW - 1
			*									
		d, Orego	on 912	19			OWRI		514	182		Start Card #135244
		6-0717				-	OGGEI					Matt Mudge DRILL DRILL
	OJE				~		LING					2-inch OD Split Spoon START FINISI
		Portland			South		LING M		-	:		Hollow Stem Auger Time: Time:
		W Front				EQUI	PMENT	TYP	E			Mobile Model B-59 9:35 14:05
		d, Orego				DRILI		21.4				Joel Welsh Date: Date:
'K	OJE	CT No.	2106	3	1	DRILI	LING C	ONT	RAC	CTC)R:	Geo-Tech Explorations 28-Aug-01 28-Aug-
	z	BEI		mdd	F			(8				BORING DIAMETER: 10-inch OD
	S	5)E (T)	ot)		t bg	TEH			CASING DIAMETER: 2-inch ID
SLL	ATT	Z		PAC	Dx.	5 fo	SRY	(fee	WA.			SURFACE ELEVATION: 30.68 feet msl**
WE	ET	PLI	63	DSI	RE	.0/8	PLE	HI	SPE	E	333	TOP OF CASING ELEVATION: 30.39 feet msl**
2000	DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB RESULT NWTPH-Dx (ppm)	SPT (blows/0.5 foot)	SAMPLE	DEPTH (feet bgs)	GROUNDWATER	amo	(USCS)	SOIL DESCRIPTION
		nument.								202		Asphalt - 4 inches thick
	Co	ncrete						1				
			9:45	-	1	1 14	0	2		888	8888 GW	GRAVEL with some Sand and Concrete (fill)- brown, moist, very
			5.40	-		40	0	3			 	dense non-plastic, slightly graded, no odor, discoloration or staining
	Rips					50>	0				$\widetilde{\mathbb{H}}$	CONCRETE (fill)
	ite O							4		**	₩ 3W	
	3/4-Inch Bentonite Chips					-					****	CONCEPTE (CIV
	th Be		9:54	-	1	50>	1 0	5			 	CONCRETE (fill)
	4-In					-		6		× (‱ }₩	
	683					1					****	
ลอาก								7		鬪	龖	CAND 11 CTL b 1 1
VCC			10:02	-		4	100			1	SM	SAND with some Silt - brown, moist, mdium dense, non-plastic, poorly graded, no odor, discoloration or sheen
ID P						7	100	8		H	卌	
2-Inch ID PVC Casing								9		\parallel	Ш	CONCRETE (fill)
24							1					
			10:07			50	90	10			Ш	WOOD (fill)
							3.0	11			Ш	
						-	-	12			1111	
					1						Ш	
								13			Ш	
						1		14				
			11:22			50>	90	15				
		-			!							
	1							16				
	ack								1			
	Sand Pack							17	9/28/01			
	20 S					-		18		1	340953	
_	Colorado 10/20							10	7	S	SM	SAND with some Silt - dark grey, mosit to wet, loose, non-plastic, poorly graded, no odor, discoloration or sheen
	lorad			D. P.A.				19	1	1		poorly graded, no odor, discoloration or sheen
	S										7.7	
_	100		12:26	-	-	2	100	20		I III		

	AND A			S, INC.		3/10	ATE	E.O	DEST	C WINT Y AITEMPTED	BANK	,					
	Sixth A									G WELL NUMBER	MW -	1					
ortlan	d, Orego	on 9720)9			OWRI) #L	514	82	Start Card #135244							
503) 79	6-0717	W.			HAI L	OGGEF	2:			Matt Mudge	DRILL	DRILL					
ROJE	CT:				SAMP	LING N	ETF	HOL);	2-inch OD Split Spoon	START	FINISI					
ort of I	Portland	d Term	inal 1	South	DRILL	ING M	ETH	OD:		Hollow Stem Auger	Time:	Time:					
100 NY	W Front	Street	,		EQUII	PMENT	TYF	E		Mobile Model B-59	9:35	14:05					
ortlan	d, Orego	on			DRILI					Joel Welsh	Date:	Date:					
	CT No.				DRILL	ING C	ONT	RAC	CTOR:	Geo-Tech Explorations	28-Aug-01	-					
	SH.		3							BORING DIAMETER: 10-inc	h OD						
NO	SAMPLE NUMBER		HEADSPACE (ppm)	LAB RESULT NWTPH-Dx (ppm)	-		(sgo	SR		CASING DIAMETER: 2-inch	7-7						
LS	5		CE	×(p) ×	foot	>1	DEPTH (feet bgs)	GROUNDWATER			feet msl**						
TAL	田		SPA	ESSI H-D	0.5	EB	I (fe	DW	A.	The state of the s	feet msl**						
NST	MPI	1E	AD	3 R	Wa/	MPI	PTF	5	ZAT (CS)	TOT OF CASHAGEBEVATION. 50.53	ieet mai						
CONSTRUCTION	SA.	TIME	HE	NA	SPT (blows/0.5 foot)	SAMPLE	DE	GRO	STRATA (USCS)	SOIL DESCRIPTION							
					2	100											
					2	100	21		SM	SAND with some Silt - dark grey, wet, lo graded, no odor, discoloration, or sheen	ose, non-plastic, p	oorly					
										galacti, at odds, alootis at allows							
							22										
d Pack							23										
3							20										
Sk E					-		24			CAND -: Al Cill	Jinaalamatia						
Sand Pack					1					SAND with some Silt - as above, no odor sheen	, discoloration, or						
San		12:33	-		1	100	25	V	SM								
Colorado 10/20					2	100		11	SEC								
ado a					3	100	26	8/28/01	SP	SAND - brown, wet, loose, non-plastic, I discoloration, or sheen	oorly graded, no o	dor,					
Solor							OFF			discontinuon, or sireen							
					1		27										
					-		28										
- 編編							29										
		12:44	-		20	100				SAND - as above, dense, no odor or disco	loration, possible	sheen					
					21	100			SP								
					21	100	31	1									
					-		20										
							32										
							33										
	7.3																
							34										
	0 11					La Til				Boring terminated at 33.5 feet bgs	, monitoring wel	1					
				1/1			35			constructed to 32 feet bgs							
										Sample No. Prefix = 5106-010828-							
					-		36			- 0100 0100EG							
					-		05			** City of Portland datum							
		-					37										
							38										
							00										
	7.3.5						39										
									- 749								

		AND A			S, INC.		MO	NIII	FO	DIN	G WELL NUMBER	MW -	2					
												TAT AA -	4					
		d, Oreg	on 9720	19			OWRI		148	3	Start Card #135245							
	-	6-0717		44		-	OGGE	-		1	Matt Mudge	DRILL	DRILL					
	OJE					SAMP	LING N	AETH	IOI):	2-inch OD Split Spoon	START	FINISH					
Por	t of]	Portlan	d Term	inal 1	South	DRILI	ING M	ETH	OD:	:	Hollow Stem Auger	Time:	Time:					
210	10 N	W Front	Street			EQUII	PMENT	TYP	E		Mobile Model B-59	14:10	16:00					
		d, Oreg				DRILL	ER:				Joel Welsh	Date:	Date:					
PR	OJE	CT No.	5106			DRILI	ING C	ONT	RAC	CTOR:	Geo-Tech Explorations	28-Aug-01	28-Aug-0					
		ER		(mdd)	2			_			BORING DIAMETER: 10-	inch OD						
	DETAILS	SAMPLE NUMBER		d) 2	LAB RESULT NWTPH-Dx (ppm)	t)		DEPTH (feet bgs)	ER		CASING DIAMETER: 2-in	nch ID						
T	LES	Z		HEADSPACE	DX (SPT (blows/0.5 foot)	SAMPLE	eet	GROUNDWATER		SURFACE ELEVATION: 28.	45 msl**						
WELL	TA	LE		SP	RES PH-1	70.5	VE VE	H (f	ND	TA (S	TOP OF CASING ELEVATION: 28.	16 msl**						
-	DA	MP	TIME	CAD	WITH	Tows	A00	M	100	STRATA (USCS)								
_	_	resistes/resistes/reds	H	H	SE	SP	SA	DE	GR	ST	SOIL DESCRIPTION							
Fh	STATE OF THE PERSON.	nument								04040404040404	Asphalt - 3 inches thick							
	HC	oncrete				1		1		88888888 8 GW	GRAVEL with some Sand - brown, m slightly graded, no odor, discoloration	oist, loose, non-plasti L or sheen	c,					
								2		***************************************								
			14:18	-	1	6	100			SP	SAND - brown, moist, loose, non-plast	tic, poorly graded, no	odor.					
	1111							3		DI THE	discoloration, or sheen							
	ips					0	50											
	Se Ch		-					4										
	toni		74.00			1 4	100	-		CD	CAND	3'14'1						
	Ben		14:23	-	1	1 0	100	5		SP	SAND - as above, very loose, no odor,	discoloration, or shee	en					
	4-Inch Bentonite Chips					0	40	6										
	34				i	1												
	Mi							7		CONT.								
			14:26	-	t e	1	100			SP	SAND - as above, no odor, discolorati	on, or sheen						
						0	100	8		対象が								
ing						0	80			200								
ch ID PVC Casing			1 1					9		1000								
PVC			14:29	_		1	100	10										
H ID						2	100	"		SP	SAND - as above, no odor, discolorati	ion, or sheen						
2-Inc						1	80	11		- C								
										- 500								
								12										
								40										
			1 1	_				13		in the								
								14										
										SP	SAND - as above, no odor, discolorat	ion or sheen						
			14:32	and .		2	100	15		1000	, , , , , , , , , , , , , , , , , , , ,							
						2	100	1										
	1 E					2	100	16		SM	SAND with some Silt - brown, moist, poorly graded, no odor, discoloration,	very loose, non-plast or sheen	c,					
	Pack										, , , , , , , , , , , , , , , , , , , ,							
	Sand							17										
	720 \$							18										
	Colorado 10/20 Sand Pack							10										
	lorac							19										
	10							*****		Alles Lie	SAND - dark gray, moist, loose, non-	st, loose, non-plastic, poorly graded, no odor,						
	1		14:38	-		14	100	20		SP	discoloration, or sheen							

	AND A			S, INC.		MO	NI	ГО	RIN	G WELL NUMBER	MW -	2
ortlan	d, Orego	on 9720	09			OWRI	0 #5	148	3 5	Start Card #135245		
	96-0717				HALL	OGGEF	¿:			Matt Mudge	DRILL	DRILL
ROJE					1	LING N		IOI)-	2-inch OD Split Spoon	START	FINISH
	Portland	d Term	inal 1	South		ING M				Hollow Stem Auger	Time:	Time:
	W Front			Double		PMENT		-		Mobile Model B-59	14:10	16:00
	d, Orego				DRILL		111	D		Joel Welsh	Date:	Date:
	CT No.					ING C	ONT	RAC	TOR.	Geo-Tech Explorations	28-Aug-01	
			B							BORING DIAMETER: 10-inch C		1
NO	SAMPLE NUMBER	100	HEADSPACE (ppm)	LAB RESULT NWTPH-Dx (ppm)			(SS)	H		CASING DIAMETER: 2-inch ID		
CTI	5		CE	x (p	foot	>-	et b	ATE		SURFACE ELEVATION: 28.45 ms		
TAI	田		SPA	H-D	SPT (blows/0.5 foot)	ER	DEPTH (feet bgs)	GROUNDWATER	4	TOP OF CASING ELEVATION: 28.16 ms.		
NST	MPI	E	ADS	B R	MB/	MPI	PT	150	TAT (CS)	TOP OF CABING ELEVATION: 20.10 ms		
CONSTRUCTION DETAILS	* SAJ	TIME	HE	NW	SP (blo	SAMPLE	DE	GR	STRATA (USCS)	SOIL DESCRIPTION		
					21 24	100	21	-	SP	SAND - dark gray, moist to wet, dense, non-	plastic, poorly	graded,
					24	10		-		no odor, discoloration, or sheen		
							22	8/28/01				
							00	1				
				1			23					
							24	V				
								1				
-1 2		14:43	-		8	100	25	9/28/01	1912	SAND - as above, wet, no odor, discoloration	or sheen	
Sand Pack					14	100	0.0	1	SPI			
Sand	Colorado 10/20 Sand Pack				26	100	26					
7,20							27					
do 10/20 9		j			1				126500			
olora		i		1	İ		28		S Cy			
							29					
		14.40				100	000		SP	SAND - as above, wet, lose, no odor, discolo	ration or sheen	
		14:48	-	1	2	100	30					
					6	100	31		SM	poorly graded, no odor, discoloration, or shee	en	
							32					
阿斯斯斯					1		33					
							34					
										Boring terminated at 33 feet bgs, monit constructed to 32 feet bgs	coring well	
							35			constituence to de feet ugs		
							36			Sample No. Prefix = 5106-010828-		
										** City of Portland datum		
							37					
							38					
							39					

434	NW	Sixth .	Avenue		S, INC.						G WELL NUMBER		MW -	3
		d, Oreg		19			OWRI		148	54	Start Card #135246			
-		96-0717					OGGEF	-			Matt Mudge		DRILL	DRILL
	OJE		ten i			-	LING				2-inch OD Split Spoon		START	FINISH
Por	t of	Portlan	d Term	inal 1	South	DRILI	ING M	ETH	OD:		Hollow Stem Auger		Time:	Time:
210	00 N	W Fron	t Street	;		EQUII	PMENT	TYF	E		Mobile Model B-59		16:05	17:42
		d, Oreg				DRILI	ER:				Joel Welsh		Date:	Date:
PR	OJE	CT No.	5106			DRILI	ING C	ONT	RAC	CTOR:	Geo-Tech Explorations		28-Aug-01	28-Aug-0
	7	NUMBER		HEADSPACE (ppm)	3			-			BORING DIAMETER: 10	0-inch OD		
-	DETAILS	IME		E (p	LAB RESULT NWTPH-Dx (ppm)	5		DEPTH (feet bgs)	LER		CASING DIAMETER: 2-	inch ID		
T		Z		AC	Dx	SPT (blows/0.5 foot)	SAMPLE	feet	GROUNDWATER		SURFACE ELEVATION: 2'	7.97 feet m	sl**	
WEL	ETA	J.E		SP	RES PH-	3/0/2	OLE VE	H.	R	E)	TOP OF CASING ELEVATION: 2'	7.56 feet m	sl**	
18.00	DA	SAMPLE	TIME	EAI	A MIL	Two	ME	FP	202	STRATA (USCS)				
			II	臣	12	Sign	RE	ā	8	58	SOIL DESCRIPTION			
_		nument						1		**********	Asphalt - 4 inches thick			
		oncrete				1		1		GW	GRAVEL with some Sand - brown, slightly graded, no odor, discoloration	moist, loose, on, or sheen	non-plastic	,
							-	2		**************************************		, ,		
		005	16:12	-		1 7	100			SP	SAND - brown, moist, medium dens	e, non-plast	ic, poorly gr	aded,
						16	100	3		492 E	no odor, discoloration, or sheen			
Bentonite Chips	ps					7	50							
	Ch							4						
	Lonit		10.10			2	100	5						
	Ben	-	16:18	_	1	1 5	100	1 0		SP	SAND - as above, loose, no odor, dis-	coloration o	r sheen	
	3/4-Inch					5	50	6			01112 - 25 45010, 10050, 10 0401, 415	coronavada, o	I DIICOII	
	3/4.					1				1				
	Mi						30.3	7	-					
60			16:22	-		6	100			And to bury				
Sasin						8	100	8		SP	SAND - as above, medium dense, no	o odor, disco	loration, or	sheen
2-Inch ID PVC Casing						9	100	9						
D								1 9						
Inch			16:31	_		2	100	10						
63						2	100			SP	SAND - as above, loose, no odor, dis	coloration o	or sheen	
						3	100	11		or Service	2212 - 23 23070, 10030, 20 0401, 415		, ontota	
								12						
						-		13						
		-			1			13		200				
								14						
				To the state of						tien varie				
			16:36	-		5	100	15		SP 1	SAND as shows madi	odor dissal	oration	hoor
	盔					10	100				SAND - as above, medium dense, no	odor, discoli	oracion, or s	neen
	1 3					14	100	16			WOOD (GIV			
	1 Pack		-					40			WOOD (fill)			
	Sand							17						
	0/20							18		ШШП				
	Colorado 10/20					-		10		SP	SAND - dark gray, moist, loose, non-	plastic, poor	rly graded, n	o odor,
_	olora							19		150	discoloration, or sheen			
	O													
	靈		16:45	-		8	100	20						

134 NV	V Sixth	Avenue	,	S, INC.		MO:				G WELL NUMBER Start Card #135246		MW -	3
	96-0717				HALL	OGGEI				Matt Mudge		DRILL	DRILL
ROJE	-	Hall			-	LING N		HOD):	2-inch OD Split Spoon		START	FINISH
	Portland	d Term	inal 1	South	-	ING M				Hollow Stem Auger		Time:	Time:
	W Front			Doden	-	PMENT				Mobile Model B-59		16:05	17:42
	id, Oreg				DRILI		LIAL	Б		Joel Welsh		Date:	Date:
	CT No.		1000			ING C	ONT	RAC	CTOR:	Geo-Tech Explorations		28-Aug-01	1
			(F)							BORING DIAMETER:	10-inch OD	20116	1
NO	NUMBER		HEADSPACE (ppm)	LAB RESULT NWTPH-Dx (ppm)			gs)	'R		CASING DIAMETER:	2-inch ID		
CTI	5		CE	x (p	SPT (blows/0.5 foot)	×	DEPTH (feet bgs)	GROUNDWATER		SURFACE ELEVATION:	27.97 feet m	**	
CONSTRUCTION	田田		SPA	ES!	0.5	SAMPLE	I (fe	MC	A.	TOP OF CASING ELEVATION:	***************************************		
NST	MPI	E	ADS	B R	l ws/	MPI	PTF	N510	RAT (CS)	TOP OF CASING ELEVATION:	21.00 feet in	ISI	
00	SAMPLE	TIME	HE	ME	SP (blo	SAI	DE	GRO	STRATA (USCS)	SOIL DESCRIPTION			
					8	100			きるかと	SAND - dark gray, moist, medius	m dense, non-p	lastic poorl	v graded.
					10	100	21		SP	no odor, discoloration, or sheen		, , ,	, 6,
							000		or Teles				
		1 1					22						
							23		强烈的				
日義								V					
							24	01					
H W		10.53				100	-	9/28/01	167/16				
Pac l		16:51	-	1	3	100	25	60	SP	SAND - as above, wet, loose, no o	dor, discolorat	ion, or sheer	a
Sanc					4	100	26						
0/20	16:51 -			!	1	1			A STATE OF THE STA	SAND with some Silt - dark grey	, wet, very loo	se, non-plas	tic.
ado							27	8/28/01	SM	poorly graded, no odor, discolora	tion, or sheen		
Colorado 10/20 Sand Pack							-	8/					
ASSESSED AND ASSESSED ASSESSED AND ASSESSED AND ASSESSED AND ASSESSED ASSESSED AND ASSESSED ASSE		1 1		1	1		28						
							29						
			97		1		1						
		16:56	-		2	100	30			SAND with some Silt - as above	, no odor, disco	loration, or	
					3	100			SM	sheen	, ,		
				1	3	10	31						
							32						
					1		1						
							33						
							34		700	Boring terminated at 33 fee constructed to 32 feet bgs	et bgs, monito	oring well	
							25		P. T.	communication to az feet bgs			
					1		35			* Sample Prefix Number is	4838-010828	-	
							36			** ("1			
				1						** City of Portland datum			
					1		37						
							38						
							39						
				1			39						
		-					40						

434	NW	Sixth A	Avenue	9	S, INC.						G WELL NUMBER		MW -	4
		d, Oreg	on 972	09		77.17.5	OWRI		014	+00	Start Card #135242		nn	Press
-	-	06-0717		F			OGGE				Matt Mudge		DRILL	DRILL
)JE		1 00		0 17		LING N		_		2-inch OD Split Spoon		START	FINISH
		Portlan			South		ING M				Hollow Stem Auger		Time:	Time:
		W Front		t			PMENT	TYP	E		Mobile Model B-59		9:23	11:40
		d, Oreg				DRILI		037777T	246	MOD	Joel Welsh		Date:	Date:
K	NE	CT No.	2106	3	1	DRILL	ING C	UNTI	KAC	TOR:	Geo-Tech Explorations		27-Aug-01	27-Aug-0
. 1	4	SAMPLE NUMBER		HEADSPACE (ppm)	(iii			(S.	24			10-inch OD		
TY	DETAILS	MS) E	LAB RESULT NWTPH-Dx (ppm)	ot)		DEPTH (feet bgs)	GROUNDWATER			2-inch ID		
JIE STILL	AIL	Z		PAC	Dxq-	SPT (blows/0.5 foot)	SAMPLE RECOVERY	(fee	WA	_		30.35 msl**		
WE	DET	PLI	E)	DS	RE	18/0	PL	TH	INS	ATA	TOP OF CASING ELEVATION: 2	29.84 msl**		
NO		AM	TIME	IEA	AB TWT	PT	AM	EP	ROI	STRATA (USCS)	SOIL DESCRIPTION			
CATHOLICA	The second	mument	1 1	Щ	1 12	1000	ME		0	W.C.	Asphalt - 4 inches thick			
	H 0	oncrete						1			WOOD (fill)			
										100 M	WOOD (MI)			
1								2						
		001	9:50	-		10	100			SP	SAND with trace Silt - brown, moi discoloration, or sheen	st, loose, poo	orly graded,	no odor,
			1		1	5	100	3			discoloration, or sheen			
						4	00	4		Y				
					1		1							
			-	-		5	0	5						
						4	0			SP	SAND with trace Silt- as above, no	o odor, disco	loration, or s	heen
-	in					3	0	6						
	Ships			-				7						
	Bentonite Chips		-	_	1	1 4	100	1						
	ento					5	100	8		SP	SAND with trace Silt - as above, n	o odor, disco	loration, or s	heen
. 1	9					5	100	148						
nch ID PVC Casing	3/4-Inch							9						
NC.	1					-	*00				SAND with trace Silt - as above, n	n odor dina	Invotion or o	haan
9			1	-	1	5	100	10		SP	SAND with trace out - as above, i	io odor, disci	noration, or s	meen
Z-Inch						4	100	11						
2														
		V. All						12						
							-	13		37				
								14						
								1-2						
			-	-		1	100	15		1				
						2	100				SAND with some Silt - dark grey,	moist, very l	oose, non-pla	stic,
	100					1	100	16		SM	slightly graded, no odor, discolora	tion, or shee	n	
	Pack							100						
	Sand							17.						
	0/20					7		18						
	Colorado 10/20				-			1						
	olora				U 2.6			19			GIND III OII	,	1	,
	C									SM	SAND with some Silt - as above, n	o odor, disc	oloration, or s	sheen
-	77.5		-	-		5	100	20		4月10年				

	AND A			S, INC.		MO	NI	ГО	RIN	G WELL NUMBER	MW -	4
Portlan	d, Orego	on 972	09			OWRI	D#L	514	180	Start Card #135242		
503) 7	96-0717				HAIL	OGGER	R:			Matt Mudge	DRILL	DRILL
PROJE	CT:				SAMP	LING	METH	IOD);	2-inch OD Split Spoon	START	FINISH
ort of	Portland	d Term	inal 1	South	DRILL	ING M	ETH	OD:		Hollow Stem Auger	Time:	Time:
	W Front					PMENT				Mobile Model B-59	9:23	11:40
ortlar	d, Orego	on			DRILI					Joel Welsh	Date:	Date:
	CT No.					ING C	ONT	RAC	TOR:	Geo-Tech Explorations	27-Aug-01	1
	SR		E	-						BORING DIAMETER: 10-inch		
CONSTRUCTION DETAILS	NUMBER	12.4	HEADSPACE (ppm)	LAB RESULT NWTPH-Dx (ppm)	-		gs)	SR		CASING DIAMETER: 2-inch I	D	
CTI	EN EN		CE	NX (T	SPT (blows/0.5 foot)	XX	DEPTH (feet bgs)	GROUNDWATER		SURFACE ELEVATION: 30.35 m		
L'EL	SAMPLE 1		SP	ESS H-L	0.5	SAMPLE	H (fe	NON	A.C	TOP OF CASING ELEVATION: 29.84 m		
NST	MP	TIME	AD.	B H	T JWS/	MP	PT	150	STRATA (USCS)			
9	SX*	TIL	HE	NE NE	SP	SARE	DE	GR	ST.	SOIL DESCRIPTION		
									SM	SAND with some Silt - dark grey, moist, m plastic, slightly graded, no odor, discolorat	edium dense, no ion, or sheen	n-
日麓												
日製		1			1		22	V				
							23	1/01				
							"	8/27/0				
Pack							24		SM			
Ullilli Sand Pa												
111		-	-		3	100	25	1		SILT with some Sand - dark grey, wet, me plastic, no odor, discoloration, or sheen	dium stiff slight	tly
0.010-in Slotted PVC Scre					3	100	26		ML	plastic, no odor, discoloration, or sheen		
Colorado 1				1	1	1 200	1 20	9/28/				
					1 1 8	~~	27					
		1			1		28					
							29					
三臘		1		i	1		1 40					
日臘		<u> </u>	-		2	100	30			SILT with some Sand - as above, no odor,	discoloration, or	
日鄉		i			3	100			ML	sheen		
					3	10	31					
日翻							-					
- 認得		1		1	1		32			Boring terminated at 32 feet bgs, mo	nitoring well	
					1		33			constructed to 32 feet bgs	8	
							34			* Sample Prefix Number is 4838-010	827-	
							35			** City of Portland datum		
							36					
							37					
							38					
							39					
							40					

		AND A			S, INC.		MO	NI	ro	RIN	G WELL NUMBER	MW -	5
Port	lan	d, Orego	on 9720	09			OWRI	D 3L	514	486	Start Card #135248		
		6-0717				HAIL	OGGEI	2:			Matt Mudge	DRILL	DRILL
	JE			156		SAMP	LING N	METH	HOD):	2-inch OD Split Spoon	START	FINISH
		Portland	d Term	inal 1	South	DRILI	ING M	ETH	OD:		Hollow Stem Auger	Time:	Time:
		W Front				-	PMENT				Mobile Model B-59	10:35	12:30
	-	d, Orego				DRILI					Joel Welsh	Date:	Date:
_		CT No.	Market Street				LING C	ONT	RAC	TOR:	Geo-Tech Explorations	29-Aug-01	29-Aug-0
-				(i)							BORING DIAMETER: 10-inch		
CONSTRUCTION	-	SAMPLE NUMBER *		HEADSPACE (ppm)	LAB RESULT NWTPH-Dx (ppm)	-		gs)	R		CASING DIAMETER: 2-inch II		
J. T. L.	LS	5		CE	x (p	foot	>	et b	ATE		SURFACE ELEVATION: 33.23 m		
RIT	TAI	E,		PA	ESI H-D	SPT (blows/0.5 foot)	SAMPLE	DEPTH (feet bgs)	GROUNDWATER	A	TOP OF CASING ELEVATION: 33.04 m.		
WST	DE	MPI	田田	ADS	N R	ws/	MPI	PTF	150	ZAT (CS)	TOP OF CASING ELEVATION. 33.04 III	51	
COS		SAI*	TIME	HE	NAE	SP7	SAI	DE	GRC	STRATA (USCS)	SOIL DESCRIPTION		
Flus	h Mo	nument									Asphalt - 3 inches thick		
	C	oncrete						1		TO THE STATE OF			
-								-		SP	SAND - brown, moist, medium dense, non-j no odor, discoloration, or sheen	plastic, poorly gr	aded,
		007	11:00	-		1 5	100	2			no odor, discoloration, or sheer		
		001		6	100	3		Kot said					
					İ	9	80						
								4					
					}								
			11:05	-	1	7	100	5		SP	SAND - as above, loose, no odor, discolorat	ion, or sheen	
-					-	2	100	1					
	8		; 		1	5	10	6		100			
-	3/4-Inch Bentonite Chips					1		7					
	nite		11:08	-		3	100			SP	SAND - as above, no odor, discoloration, or	sheen	
	Bento					4	100	8		2000			
	och E					5	100						
be	3/4-I					-		9					
PVC Casing	1		11:10		-	4	100	10					
VCC			11:10	_		1 4	100	1 10		SP	SAND - as above, no odor, discoloration, or	sheen	
						4	100	11					
2-Inch ID					1	1							
2								12					
			İ										
								13					
								14					
						1		1 14					
			11:14	_		4	100	15		SP	SAND - as above, no odor, discoloration, or	sheen	
- Carrie						5	100						
444	IIII					7	100	16		1 - 62			
	sck												
	d bu							17					
	o San					-		10					
	10/2					-		18					
	Colorado 10/20 Sand Pack							19			CAND		
	Colo									SP	SAND - as above, no odor, discoloration, or	sheen	
	The second		11:18	-		3	100	20					

434 NV	AND A V Sixth	Avenue		S, INC.		MO				G WELL NUMBER Start Card #135248	MW -	5
	96-0717				HAIL	OGGEI				Matt Mudge	DRILL	DRILL
PROJE						LING		HOD):	2-inch OD Split Spoon	START	FINISH
	Portlan	d Term	inal 1	South		ING M				Hollow Stem Auger	Time:	Time:
	W Fron					PMENT				Mobile Model B-59	10:35	12:30
	nd, Oreg				DRILI					Joel Welsh	Date:	Date:
	CT No.					ING C	ONT	RAC	TOR:	Geo-Tech Explorations	29-Aug-01	29-Aug-0
	S.R.		(H	1 0						BORING DIAMETER: 10-inch OI)	
CONSTRUCTION DETAILS	** * * * * * * * * * * * * * * * * * *		HEADSPACE (ppm)	LAB RESULT NWTPH-Dx (ppm)	0		ogs)	ER		CASING DIAMETER: 2-inch ID		
LS	DN DN		ACE	15°C	SPT (blows/0.5 foot)	RY	DEPTH (feet bgs)	GROUNDWATER		SURFACE ELEVATION: 33.23 msl*	*	
WEI	E		SP	RES PH-I	70.5	SAMPLE	H (f	P P	TA	TOP OF CASING ELEVATION: 33.04 msl*	*	
NS	MP	TIME	SAD	B	Towns	SCO	PT	too:	STRATA (USCS)			
Ö	N.*	II	H	35			10	GR		SOIL DESCRIPTION		
		1			5	100	21					
	-	1		1	1 0	100	21		SM	SAND with some Silt - dark grey, moist, loos graded, no odor, discoloration, or staining	e, non-plastic	, poorly
		i					22			graded, no odor, discoloration, or staining		
							23					
							24	-				
u de				1	1		1 24					
C Ser		11:22	_		3	100	25	8/29/01		SAND with some Silt - as above, wet, no odor	diamlanation	
Ad Pu					3	100		8/2	SM	or sheen	, discoloration	1,
lotte 1111 20 Sa	Colorado 10/20 Sand Pack				4	100	26					
Lin S		-										
0.010-in Slotted PVC Screen	-	1					27	Y				
3		-					28	9/28/01				
		1			1		1	9/2				
							29					
日徽		11:26	-		1 2	100	30		SM	SAND with some Silt - as above, very loose, n	o odor,	
					1	100	31			discoloration, or sheen		
							1					
							32					
				ļ								
							33					
							34					
対数数					1	i	1 34					
- Albertants							35		- ALESSA GARAGE			
		1			1		1			Boring terminated at 34.5 feet bgs, mor	itoring well	
							36			constructed to 34 feet bgs		
										* Sample Prefix Number is 4838-01082)-	
							37					
							38			** City of Portland datum		
							00					
							39					
							40					

HA	HN	AND A	SSOC	LATE	S, INC.										
434	NA	Sixth A	Avenue	3			MO	NI	I'C	RIN	G WELL NUMBER	MW -	6		
Por	tlan	d, Oreg	on 972	09			OWR	D #L	51	481	Start Card #135243				
50	3) 79	96-0717				HAIL	OGGE	₹:			Matt Mudge	DRILL DRI			
PRO	OJE	CT:				SAMP	LING	METH	OI);	2-inch OD Split Spoon	START	FINISH		
Por	t of	Portlan	d Term	inal 1	South	DRILI	LING M	ETH	OD:		Hollow Stem Auger	Time:	Time:		
210	0 N	W Front	Stree	t		EQUIPMENT TYPE					Mobile Model B-59	7:32	9:15		
Por	tlan	d, Oreg	on			DRILI	DRILLER: Joel Welsh Date:						Date:		
		CT No.			17.13	DRILI	ING C	ONTI	RA(CTOR:	Geo-Tech Explorations	28-Aug-01	28-Aug-0		
		ER		(mi	3						BORING DIAMETER: 10-inch (OD			
-	DETAILS	SAMPLE NUMBER		HEADSPACE (ppm)	LAB RESULT NWTPH-Dx (ppm)	3	133	DEPTH (feet bgs)	ER		CASING DIAMETER: 2-inch II)			
T	ILS ILS	N		ACE	5×	SPT (blows/0.5 foot)	RY	eet	GROUNDWATER		SURFACE ELEVATION: 30.62 fee	t msl**	1 1 11		
WEL	TA	臣		SP	RES H-I	70.5	SAMPLE	H (f	NDV	LA (S	TOP OF CASING ELEVATION: 30.25 fee				
NYCH	D	MP	TIME	CAD	WITH	Tows	MP	PT	UO.	STRATA (USCS)					
			T	HE	SE	SP	SA	DE	GR	PS S	SOIL DESCRIPTION				
		nument								00000000	Asphalt - 4 inches thick				
	H C	oncrete				-	}	1							
	777		-					2							
			7:48	-	1	10	0			₩ GP	GRAVEL with some Sand - moist, medium of	lense, non-plast	ic,		
						11	0	3			slightly graded, no odor, discoloration, or sh	een			
						15	0								
					-			4							
		004	7:53	_	ND	6	100	5							
		- 00.	1		1	1 6	100	1		GP }	GRAVEL with some Sand - as above, loose, discoloration, possible sheen	no odor or			
						6	70	6							
	sqii				1			i							
bo	te Cl		1			1 0	1 100	7			GRAVEL with some Sand - as above, loose, no odor or				
Casin	ntoni		7:57	-		6	100	8		GP 3	discoloration, possible sheen	no odor or			
2-Inch ID PVC Casing	3/4-Inch Bentonite Chips				1	5	100								
ID!	4-Inc	-						9							
Inch	8														
63						4	100	10		6 GP	GRAVEL with some Sand - as above, loose,	no odor or			
						5	100	11		88888888	discoloration, possible sheen				
			1		1	4	100	11							
								12							
								13							
						1		14							
			8:03	-		4	100	15		******	GRAVEL with some Sand - as above, loose,	no odor discolo	ration		
						3	100			8 GP	or sheen	20 odor, discoit	auton,		
						6	100	16							
	Pack				75.15										
	nd Pa							17							
	O Sar			-				18							
	Colorado 10/20 Sand		-					10							
	rado		*******					19							
	Colo					1				GP	GRAVEL with some Sand - as above, loose, or sheen	no odor, discolo	oration,		
	-		8:07 - 2 100 20 or sneen												

HAHN 434 NW	Sixth A	Avenue	9	S, INC.						G WELL NUMBER	MW	- 6		
Portland	d, Orego	on 972	09			OWR	D #L	514	481	Start Card #135243				
503) 79	6-0717				HAIL	OGGEI	R:			Matt Mudge	DRIL	L DRIL		
PROJE(CT:				SAMP	LING N	METH	IOI);	2-inch OD Split Spoon	STAR	T FINIS		
ort of H	Portland	d Term	inal 1	South	DRILI	ING M	ETH	OD		Hollow Stem Auger	Time:	Time:		
100 NV	W Front	Street	t		EQUII	PMENT	TYP	E		Mobile Model B-59	e Model B-59 7:32			
Portland					DRILI	ER:				Joel Welsh	Date:	Date:		
PROJEC	CT No.	5106			DRILI	ING C	ONT	RAC	CTOR:	Geo-Tech Explorations	28-Aug	-01 28-Aug		
7	SER		pm)	3			3			BORING DIAMETER: 10-	inch OD			
OLI	JME		E (p	Tr.	ot)		pgq :	FER		CASING DIAMETER: 2-in	ich ID			
4555	K		AC	SCI	5 for	SAMPLE	feet	WAS		SURFACE ELEVATION: 30.62 feet msi**				
WE	PLE	63	DSF	RE PH.	B/0.1		DEPTH (feet bgs)	ND	NTA S)	TOP OF CASING ELEVATION: 30.25 feet msl**				
WELL CONSTRUCTION DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB RESULT NWTPH-Dx (ppm)	SPT (blows/0.5 foot)	AM	EP	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION				
1888	Ø.*	F	耳	ZLI	3	100	1 0	0	かじ			1		
					3	100	21			SAND with some Silt - dark grey, moi slightly graded, no odor, discoloration	st to wet, loose, n , or sheen	on-plastic,		
			7.35			1	21	8/0	SM					
				180			22	8/2	DIM					
			4 1/1					V						
							23	3/01						
							24	9/28/01						
7 1					1		1 24			CAND - 'AT S'H		,,		
d Pa		8:12	-		1	100	25		SM	SAND with some Silt - as above, wet, or sheen	no odor, discolora	tion,		
Sand		2 100												
ado 10/20 S					4	100	26	1						
Colorado 10/20 Sand Pack	- 1						000							
Colorado						198	27							
							28							
目鑿														
							29							
		0.10			0	100	000							
		8:16	-	1	3	100	30		SM	SAND with some Silt - as above, no or	dor discoloration	or		
					5	100	31		SM	sheen	, , , , , , , , , , , , , , , , , , , ,			
三黨							32							
-					-		33		Pay S					
-							34							
1							04	-						
							35			Boring terminated at 32 feet bgs	s, monitoring we	n		
										installed to 32 feet bgs				
							36	1		* Sample Prefix Number is 4838	-010828-			
					-		0.5				2.0020			
-							37-			** City of Portland datum				
-							38							
1							50							
1							39							
		5 46												
	5-11-11		47				40	1						

HAHN	AND A	SSOC	IATE	S, INC.								
	W Sixth									G WELL NUMBER	MW -	7
Portla	nd, Oreg	on 972	09			OWR	D #L	514	85	Start Card #135247		
503) 7	96-0717				HAI L	OGGE	R;			Matt Mudge	DRILL	DRILL
PROJE	ECT:				SAMP	LING I	METH	IOI):	2-inch OD Split Spoon	START	FINISH
Port of	Portlan	d Term	inal 1	South	DRILI	ING M	ETH	OD	:	Hollow Stem Auger	Time:	Time:
2100 N	W Fron	Stree	t		EQUI	PMENT	TYP	E		Mobile Model B-59	8:45	10:30
Portla	nd, Oreg	on			DRILI					Joel Welsh	Date:	Date:
	ECT No.				_	ING C	ONT	RAC	CTOR:	Geo-Tech Explorations	29-Aug-01	29-Aug-0
	出		Î							1	OD; 4-inch ID	
NO	SAMPLE NUMBER		HEADSPACE (ppm)	LAB RESULT NWTPH-Dx (ppm)			(88)	J.R.		CASING DIAMETER: 2-inch		
JEST	5		CE	X (p	foot	. >4	et b	ATE				
WELL CONSTRUCTION DETAILS	E		SPA	EST	SPT (blows/0.5 foot)	SAMPLE	DEPTH (feet bgs)	GROUNDWATER	A	SURFACE ELEVATION: 33.76 feet msl** TOP OF CASING ELEVATION: 33.51 feet msl**		
AST DE	Idy	E	ADS	TPJ	ws/	I G S	PYFE	15	STRATA (USCS)	TOP OF CASING ELEVATION: 5.	o.or reet msi	
COL	SA.	TIME	HE	LA.	SPT (blo	SAN	DE	GRC	STE	SOIL DESCRIPTION		
Fhish N	fonument									Asphalt - 4 inches thick		
E	Concrete						1		A SEA			
#										SAND - brown, moist, medium dense, non-	alastic poorly are	hohe
	3	0.57			1 0	1 100	2		SP	no odor, discoloration, or sheen	masue, poorty gra	aueu,
	006	8:57	-		8	100	3					
					1 8	100	1					
							4					
		9:02			. 3	0	5		SP	SAND - as above, loose, no odor, discolorat	ion, or sheen	
					7	0						
Elle	3				3	0	6					
3/4-Inch Bentonite Chips	7					-						
ite O	-	9:06	_	1	1 2	100	7		SP	SAND - as above, very loose, no odor, disco	loration, or shee	n
nton		3.00	7.00		2	100	8		Terror State of			
th Be	3				2	100			- A. G			
4-Inc							9					
33					16				100 mg 10			
M		9:09	-		1	100	10		SP	SAND - as above, no odor, discoloration, or	sheen	
a 111					1	100						
asin M					1	100	11					
2-Inch ID PVC Casing	3						12		5550			
						-	12					
Inch			7-17	46			13					
i III					1.							
							14					
									CD			
		9:11	-		2	100	15		SP	SAND - as above, no odor, discoloration, or	sheen	
2200	200				1	100	16		TATE AND THE			
Pack	ACCUMANTAL STATE OF THE STATE O				1	100	10	1	12.00			
Sand Pack	200						17		TO SERVICE			
20 S	1						-					
100,	177.2		The State of State State of St		7.14		18		375137			
Colorado 10/20	200		7		1				1000			
3	4						19		CD			
						San La			SP	SAND - as above, no odor, discoloration, or	sheen	
	The state of the s	9:15	-		2	100	20		是数款			

	AND A			S, INC.		MO	NI	rc	RIN	G WELL NUMBER	MW -	7
Portlan	d, Oreg	on 972	09			OWRI	D#L	514	185	Start Card #135247		
503) 79	96-0717				HAI L	OGGEF	₹:			Matt Mudge	DRILL	DRILL
ROJE	CT:				SAMP	LING N	ÆTE	IOI):	2-inch OD Split Spoon	START	FINIS
ort of	Portlan	d Term	ninal 1	South	DRILI	ING M	ETH	OD	:	Hollow Stem Auger	Time:	Time:
100 N	W Front	Stree	t			PMENT				Mobile Model B-59	8:45	10:30
	d, Orego				DRILI				100	Joel Welsh	Date:	Date:
	CT No.					LING C	ONT	RA(CTOR:	Geo-Tech Explorations	29-Aug-01	
	K		Î								D; 4-inch ID	· Land
NO	/BE		HEADSPACE (ppm)	bm			(gg)	IR.		CASING DIAMETER: 2-inch ID	, , , , , , , , , , , , , , , , , , , ,	-
CTT	5		CE	x (p	foot	>	et b	GROUNDWATER			6 feet msl**	
ROCE	国		SPA	LAB RESULT NWTPH-Dx (ppm)	0,5	ER	DEPTH (feet bgs)	DW.	A		1 feet msl**	
VST	/IPI	E	ADS	3 R TPI	, ws/(API		15	CS)	TOP OF CASING ELEVATION: 55.5	1 leet msi**	
CONSTRUCTION DETAILS	SAMPLE NUMBER	TIME	HE,	LAI	SPT (blows/0,5 foot)	SAMPLE	DEI	GRC	STRATA (USCS)	SOIL DESCRIPTION		
188					3	100			SP	SAND - brown, moist, locose, non-plastic, poo	rly graded no	odor
					5	100	21		SI	discoloration, or sheen	rif Graded, M	, ouor,
							22					
						3	23					
ack				1			20			CONCRETE (fill)		
Sand Pack			140.7				24		2000			
O Sa										SILT with some Sand - dark grey, moist, soft	non-plastic	no
LILILILILI Colorado 10/20		9:19	-		1	100	25		ML	odor, discoloration, or sheen	, === p,	
					2	100						
Colo					2	100	26					
							27	-				
				1			41	-				
							28	8/29/0				
								8/2				
						}	29	7				
								×	********	GRAVEL with some Sand - dark grey, satura	ated, medium	
		9:25	,-	1	3	100	30	8/01	8 GP	dense, non-plastic, poorly graded, no odor, di sheen	scoloration, or	
					19	100	31	9/28		SHOOL		
		1			13	00	31			WOOD		
三臟							32					
							33					
							34			Boring terminated at 33 feet bgs, monit constructed to 32 feet bgs	coring well	
							35			* Sample Prefix Number is 4838-01082	9-	
							36			** City of Portland datum		
							37					
							38					
							39					
							40					

APPENDIX B

Monitoring Well Sampling Summary Sheets

Water Elevation Collection Summary Log

HAI Project Number: 5106

HAI Project Acronym: TONDVL

Sampler: Jill Betts, Derek Sandoz

Date 30-Oct-01

		Static Water
	Time	Level (feet btoc)
Location		
MW-1	10:50	18.64
	11:45	18.66
MW-2	10:42	24,11
141 44 - 72	11:39	'
	N V Y	24,11
MW-3	10:36	23 45
	1(:31	23,43
1077	10 : 1:4	24,90
MW-4	10:14	
	11:14	25.00
ļ		

Location	Time	Static Water Level (feet btoc)
MW-5	10:24	26,9 26,95
		2011)
·		
MW-6	9:54	23.83 NS
171 44-0	10:55	22.37
MW-7	1०३०४	28.90
	11:06	28.89

Water Elevation Collection Summary Log

HAI Project Number: 5106

HAI Project Acronym: TONDVL

Sampler: Jil Betts, Derek Sandoz Matt Mudge

Date 9 28 01

CONTRACTOR STATE AND ADDRESS OF MANAGEMENT AND ADDRESS OF THE PARTY OF	Marita de 104 de junto sanciencia.	11300Ver mortistic and according to the
& Location T	Time	Static Water & Eevel Meet bloc
ØMW-1	8:21	1852
	8:21	1852
į		
MW-2	8:17	2397
	8:17	2397
		6.5
(V)MW-3	8:13	2345
Ü	8:43	2346

ØMW-4	8:26	2484
A 11 11 - 1	9:01	2491
	9:11	2493
	1,41	<u> </u>
	<u>.</u>	
	• .	-

Location		Static Water - Level - tfeef bloc)
Ø MW-5	8:07 8:45	26 <u>93</u> 26 <u>96</u>
Ø MW-6	8:31 9:04	22 39 22 41
ØMW-7	8:35 9:07 9:22	29 25 29 25

General Information	3
Project Name: Marine Terminal 1 South	
HAI Project Number: 5106	
Date: 10 01 01	
Sampling Personnel: Math Mudue	
Purge Method: Harnless submersible	
Sampling Method: Stainless Submers ble	
of disposable butter	
Sample Information	
Sample Date: 0000	
Sample Time: 12:18 & 12:20	
Sample Number: 5106-0-60 011001 - 104 8 10	 }_
plus duplicate ->	
• •	

Well Depth (ft)	Static Water Level (ft)	Water Column (ft)	Conversion Factor (gal/foot)	One Well Vol (gal)	Three Well Volumes (gal)
32°	1853	1347	0.17	229	687

2' well =	0.17 gallons/lin	earft 4" well =	= 0.66	gallons/linear ft
Sample	Containers		でなる。	ted or Republication of the second se
Number	Туре	Preservative		Analytical Parameters
3	40ml VOA	HCL	Q	VOCs by EPA 8260B
1	1 l Amber	none	Q	TPH as diesel and oil by NW TPH-Dx
١	1 l Amber	none	0	PAHs by EPA 8270 SIM
	1 i Amber	none	Q	DEHP by EPA 8270
(250 ml plastic	none	d	TSS by EPA 160.1
1	250 ml plastic	nitric	d	filtered metals by EPA 6010
1	250 ml plastic	nitric		unfiltered metals by EPA 6010

Well Purge	e Data	35, 15	Total Vo	lume to	Purge =		Market L	
Time	Volume Purged (gallons)	Conductivity (uS/cm) x100/x1000	Temperature degrees (C/F)	рН	Turbidity (NTU)	Dissolved Oxygen	Redox Potential	Comments
12:06	0	1233	172	648	327	146	-261	Slightly turbid. No as
12:09	25	1149	174	P 25P	1267	187	-177	slightly trubod Nor odo
12:13	5	(129	175	(60	1382	63	-104	slightly trubid No odo
12:17		1118	ĮŢĬ	664	1245	166	-105	slightly turbed No odo
								I pringe bucket.
								has sheen on nater.

Purge Water	Disposition				
Drum No.	36				

General Inf	ormation
Project Name	e: Marine Terminal 1 South
HAI Project	Number: 5106
Date: 1	plaler
Sampling Pe	rsonnel: Matt Mudge
Purge Metho	, , , , , , , , , , , , , , , , , , ,
Sampling Me	ethod: Stainless submersible

			 	~
Sample Date:	10 01	01	 · · · · · ·	
Sample Time:	-\io	:38		

Well Depth (ft)	Static Water Level (ft)	Water Column (ft)	Conversion Factor (gal/foot)	One Well Vol (gal)	Three Well Volumes (gal)
32	2397	303	0.17	137	451

Sample	Containers		
Number	Туре	Preservative	Analytical Parameters
	40ml VOA	HCL	VOCs by EPA 8260B
	1 l Amber	none	TPH as diesel and oil by NW TPH-Dx
1	1 l Amber	none	PAHs by EPA 8270 SIM
1	1 l Amber	none	DEHP by EPA 8270
	250 ml plastic	допе	TSS by EPA 160.1
_\	250 ml plastic	nitric	filtered metals by EPA 6010
1	250 ml plastic	nitric	(unfiltered metals by EPA 6010

Time	Volume Purged (gallons)	Conductivity (uS/cm) x100/x1000	Temperature degrees (C/F)	рН	Turbidity (NTU)	Dissolved Oxygen	Redox Potential	Comments
10:07	0	1627	1/3	632	>200	121	-022	turbed dark grey us or
10:11	15	1461	163	1 38	609	158	-038	Slightly turbid no alon
10:13	35	1442	164	L 38	272	096	-043	slightly turbol, no odos
10:16	42	1420	164	642	122	099	-052	slightly turbed no oder
10:34	_6	13.33	167	642	2050	097	-072	Slightly turbid no eder
								# pringe bucket has
								Sheen as water.

Purge Water Disposition		
Drum No. 35		

General Information	
Project Name: Marine Terminal 1 South	
HAI Project Number: 5106	
Date: 9 28 01	
Sampling Personnel: Matt Mudge	
Purge Method: Stainless submersible	
Sampling Method: " 11	

Sample Inform	atio	2			
Sample Date:	a	78	d		
Sample Time:		13	:12		
Sample Number:	5106	<u>ر ر</u> 6-010	928-1	03	

Purge V	olume Calcul	ation			
Well Depth (ft)	Static Water Level (ft)	Water Column (ft)	Conversion Factor (gal/foot)	One Well Vol (gal)	Three Well Volumes (gal)
33	2346	854	0.17	145	430

2' well =	0.17 gallons/lin	near ft 4" well = 0).66 gallons/linear ft
Sample	Containers		
Number	Туре	Preservative	Analytical Parameters
	40ml VOA	HCL	VOCs by EPA 8260B
	1 l Amber	none	TPH as diesel and oil by NW TPH-Dx
	1 i Amber	none	PAHs by EPA 8270 SIM
	1 l Amber	none	DEHP by EPA 8270
1	250 ml plastic	none	TSS by EPA 160.1
	250 ml plastic	nitric (filtered metals by EPA 6010
	250 ml plastic	nitric	onfiltered metals by EPA 6010

Time	Volume Purged (gallons)	Conductivity (uS/cm) x100/x1000	Temperature degrees (C/F)	рΗ	Turbidity (NTU)	Dissolved Oxygen	Redox Potential	Co	mments	
12:48	0	1396	174	55	7200	100	092	Slightly	tar	bid N
12:51	15	1390	173	6 15	817	531	146	7",	ц	1.4
12:54	3	1575	193	7	1137	245	-009	1.1	l r	(c 1)
12:58	45	1472	173	6 22	1274	253	-017	11 4		11
(3:62	8	155	183	6.19	143-	353	-02/	ન ૫	١١	٠,
	Torsm	137						proved de	α	
13:07	10	1509	172	630	1913	227	-028	slightly to	whid,	No ola
			•					7		
										

Purge Wat	er Dispositio	n www.gr.y-re	alika ana	A A	10 A MARIE .	
Drum No.	35					

General Information	Purge V	olume Calcu	lation .			
Project Name: Marine Terminal 1 South HAI Project Number: 5106	Well Depth (ft)	Static Water Level (ft)	Water Column (ft)	Conversion Factor (gal/foot)	One Well Vol (gal)	Three Well Volumes (gal)
Date: 9/28/01	32	24.93	7.67	0.17	1.20	3,6
Sampling Personnel: Matt Mudge / Deal Sinh	-					
Purge Method: Spiles Subnesible	2' well =	0.17 gallons/lir	near ft	4" well = 0.60	6 gallons/lin	ear ft
Sampling Method:	Sample	Containers				
+ bailer (disposable)	Number	Туре	Prese	ervative	Analytical	Parameters
Sample Information	3	40ml VOA	HCL	Ø	VOCs by EP	A 8260B
Sample Date: 9/29/01		1 I Amber	роле	Ø	TPH as dies NW TPH-D:	el and oil by
Sample Time: 14:25		1 l Amber	none		PAHs by EP	A 8270 SIM
Sample Number: 5106-010928-104		1 l Amber	none		DEHP by El	PA 8270
	-\	250 ml plastic	none	Ø	TSS by EPA	160.1
		250 ml plastic	nitric	Ø	filtered meta 6010	als by EPA
•		250 ml plastic	nitric	Ø	unfiltered m 6010	etals by EPA

Well:Purg	e Data		Total Vo	lumeto	Purge =	3.6+	HER.	14.10 (15) 豪东河南麓东西南部
Time	Volume Purged (gallons)	Conductivity (uS/cm) x100/x1000	Temperature degrees (C/F)	рН	Turbidity (NTU)	Dissolved Oxygen	Redox Potential	Comments
度:10	0	78.5	17.4	653	200+	237	042	TURBID/NO ODOR
14:14	1.20	87.4	17.1	6.54	200+	3.20	028	TURBID/NOODOR
19:16	2.40	82.5	18.6	6.59	200+	1.70	011	" "
14:18	3.60	80:7	189	6.62	115	1.74	012	stightly turbed
	· 							J
	-							

Purge Water Disposition .	-> Drun	110	2000年度的第三	Winds in the		
Drum No. 35						

Monitoring Well Sampling Summary Sheet

WELL NUMBER:	5
" MODITORIA.	

General Information	Purge V	olume Calcu	lation.			
Project Name: Marine Terminal 1 South	Well Depth	Static Water	Water Column	Conversion Factor	One Well Vol	Three Well Volumes
HAI Project Number: 5106	(ft)	Level (ft)	(ft)	(gal/foot)	(gal)	(gal)
Date: 7 (28 0)	34	2696	704	0.17	150	3 20
Sampling Personnel: Matt Mudge						
Purge Method: Grund fos Submersible	2' well =	0.17 gallons/lic	ear ft	4" well = 0.66	6 gallons/lin	ear ft
Sampling Method: (1	Sample	Containers				
	Number	Туре	Prese	ervative	Analytical	Parameters
Sample Information		40ml VOA	HCL		VOCs by EP	'A 8260B
Sample Date: 9 28 01		1 l Amber	none		TPH as dies NW TPH-D	el and oil by
Sample Time: 11,24	1	1 l Amber	none		PAHs by EP	A 8270 SIM
Sample Number: 5106-0109 24 - 102		1 l Amber	none		DEHP by El	PA 8270
		250 ml plastic	none	()	TSS by EPA	160.1
		250 ml plastic	nitric		filtered met 6010	als by EPA
•	1	250 ml plastic	nitric		unfiltered m 6010	etals by EPA

Well Purg	e Data		Total Vo	lume to	Purge =	4	िक्कि स्ट्रांग -	er englisher i er	1. No. 1.3		ANGA IT
Time	Volume Purged (gallons)	Conductivity (uS/cm) x100/x1000	degrees	pН	Turbidity (NTU)	Dissolved Oxygen	Redox Potential		Commen	ts	
10:57	0	281	154	779	318	15-1	-043	Slightly	tout	oid his	
11:06	125	156-	160	697	MS 184	- 376	-010	slighth	1 turk	. i W	00
$H^{*}H$	259	1289	167	658	37	275	-052	1,0			1)
11:14	35	1165	175	64	60-	267	-051	11	11	11	11
11:18	5	1658	182	629	612	387	-053	•(ч	N.	١,
11:09								water co	unn	Sur face	2
								<u> </u>			
											1

250 ml plastic

Purge Water Disposition		
Drum No. 35		

General Information	<u> </u>		1 ±	
Project Name: Marine Terminal 1	Sout	th		
HAI Project Number: 5106		·		
Date: 9/28/01				
Sampling Personnel: Math Mark	AR.	/D	eek	Sardi
Sampling Personnel: MatiMid Purge Method: STAINLESS S	ا نجم	ERSIE	3LE	
Sampling Method:				4
Sample Information		-	:	
Sample Date: $9/28/c$ Sample Time: $15.3c$	·i	· · · · · ·		
Sample Time: 15'30				
Sample Number: 5106-0109 Z 4, -				

Purge V	olume Calcul	ation					
Well Depth (ft)	Static Water Level (ft)	Water Column (ft)	Conversion Factor (gal/foot)	One Well Vol (gal)	Three Well Volumes (gal)		
32.0	22.41	9.59	0.17	1.63	4.89		

	0.17 gallons/lin		= 0.60	6 gallons/linear ft
Sample	Containers			
Number	Туре	Preservative		Analytical Parameters
	40ml VOA	HCL		VOCs by EPA 8260B
	1 l Amber	none		TPH as diesel and oil by NW TPH-Dx
	1 l Amber	none	d	PAHs by EPA 8270 SIM
1	1 l Amber	none	Ó	DEHP by EPA 8270
1	250 ml plastic	none	0	TSS by EPA 160.1
1	250 ml plastic	nitric	0	filtered metals by EPA 6010
1	250 ml plastic	nitric	Ø	unfiltered metals by EPA 6010

WelliPurg	e Data		Total Vo	lume to	Purge =	4.90+	(<u>)</u> (1)		
Time	Volume Purged (gallons)	Conductivity (uS/cm) x100/x1000	Temperature degrees (C/F)	рĦ	Turbidity (NTU)	Dissolved Oxygen	Redox Potential		Comments
1515	0	82.3	17.7	6.61	142	2.19	040	SUGHTLY	TURID NO DDS
1518	1.63	76.3	17,2	6.63	76.2	1.64	-002	CLEAR	NO CDS
1520	3.26	83.2	17:0	6.58	18.61	1.40	-52	CLEAR	NO 015
1523	4.89	85.9	17.2	6.58	20.7	3.10	-92	CLEAR	NO ODS
1525	6.50	87.5	17.1	6.59	27.6	1.31	-82'i	4.5	
1577	8,10	88.3	17.0	6.60	20.7	1.36	-39		<u> </u>

Purge Water Disposition	-	An a	1,7.		est and	: .	14	- 1 ³ 1
Drum No. 35								

General Information
Project Name: Marine Terminal 1 South
HAI Project Number: 5106
Date: 10 1 01
Sampling Personnel: Matt Mudge
Purge Method: Stainless submersible
Sampling Method: Strinles submersible

Sample:Inform	ation		. NY 10 7 7 1
Sample Date:	101i	01	
Sample Time:	9:0	3	
Sample Number	5106-0	olloo!	-106

Well Depth Static Water Conversion Column Factor (ft) Level (ft) (ft) (gal/foot)	One Well Vol	Three Well Volumes
229 2025 275	(gal)	(gal)
32 29 20.17	047	140-

2 well = 0.17 gallons/hnear ft 4 well = 0.66 gallons/linear ft Sample Containers								
	Туре	Preservative	Analytical Parameters					
	40ml VOA	HCL	VOCs by EPA 8260B					
	1 l Amber	none	TPH as diesel and oil by NW TPH-Dx					
1	1 l Amber	none (PAHs by EPA 8270 SIM					
1	1 l Amber	none (DEHP by EPA 8270					
\	250 ml plastic	none (TSS by EPA 160.1					
1	250 ml plastic	nitric (filtered metals by EPA 6010					
)	250 ml plastic	nitric (unfiltered metals by EPA 6010					

Well Purg	e Data		Total Vo	lume to	Purge =	多 語。		The section of the se
Time	Volume Purged (gallons)	Conductivity (uS/cm) x100/x1000	Temperature degrees (CVF)	рН	Turbidity (NTU)	Dissolved Oxygen	Redox Potential	Comments
8:39	0	1760	1P =	633	1813	190	-015	slightly turbid No ate
8:42	05	1463	174	6 30	489	200	-064	Slightly twibid stylet alo
8:45	1	1317	172	935	273	219	-043	clear, no ador.
8:48	15	1239	18-	637	1515	203	-065	clear, no odor
8.52	2	1173	182	640	q 23	1 75	-059	clear, no odor
8:56	25	1169	189	64	1086	183	-048	Clear no odor.
						<u> </u>		•
			<u> </u>					
	į							

Purge Water Disposition	2(- ; '	A STATE OF THE STA			N	. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.
Drum No. 35			 			

Well Development Summary Sheet

WELL NUMBER: MW-

General Information		
Project Name: Marine Terminal 1 South		
HAI Project Number: 5106		
Date: 9/10/01		
Developing Personnel: Derek Sandoz		
Purge Method: SUBMURSIBLE PUM	nf	

Purge Volu	ıme Calcul	ation	arang Malang		
Total Well Depth (ft)	Static Water Level (ft)	Water Column (ft)	Conversion Factor (gal/foot)	1 Well Volume (gal)	10 Well Volumes (gal)
32	i8,35	쏠14	0.17	¥23	23
-					

Well Pur	ge Data		Total Vo	lume to	Purge =			
Time	Volume Purged (gallons)	Conductivity (uS/cm) x100/x1000	Temperature degrees (C/F)	pН	Turbidit y (NTU)	Dissolved Oxygen (%)	Redox Potential (%)	Comments
0	0	_	-	-		-		
14:50	4	3.49	76.0	3.48	181.0	18.2	-005	LT BROWN/VISIBLE RAINBOW SHEEN
15:00	8_	3.52	77.6	7.68	106,7	10.9	-012	
15:05	13_	3.45	76.3	7,65	88.2	10.1	800	
15:10	17	3.34	76.2	7.29	62.4	17.1	800	
15:20	19	3.22	74.8	7.30	1588	10.9	034	DECREASING CLARITY
15:25	13	3.15	74.5	7.31	154.6	10.9	041	
	·							
					·		-	
							_	

Purge Water Disposition			
Drum No.	 		

General Information	:	<u>:</u> , .	21ii. 11ii
Project Name: Marine Terminal 1 South			
HAI Project Number: 5106			
Date: 9/7/01			
Developing Personnel: Derek Sandoz			
Purge Method: SUBMERSIBLE PUN	26		

Purge Volume Calculation										
Total Well Depth (ft)	Static Water Level (ft)	Water Column (ft)	Conversion Factor (gal/foot)	1 Well Volume (gal)	10 Well Volumes (gal)					
32	2485	≃ ಶ	0.17	¥1.5	15					

2' well = 0.17 gallons/linear ft

4" well = 0.66 gallons/linear ft

Well Pur	ge Data		Total Vo	lume to	Purge =			
Time	Volume Purged (gallons)	Conductivity (uS/cm) x100/x1000	Temperature degrees (C/F)	рН	Turbidity (NTU)	Dissolved Oxygen (%)	Redox Potential (%)	Comments
1545	5	3.07	67.8	6.91	NOT	9.8	-224	
1550	9	3.02	68.5	6.90	OPERATING	9.9	-073	
1555	13	2.97	62.3	6,89		10.1	-072	
1609	_15_	7.93	67.1	6.54	- \	୫.୩	-070	·
1610	17_	2.93	67.1	6.59		9.0	-076	
1615	19	2.94	67.1	6.62	4	9.1	-076	
				·			ļ	
								
						_		
•	-2,							<u>,</u>
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Purge Water Disposition		2.86 2.86	
Drum No.			

General Information	
Project Name: Marine Terminal 1 South	
HAI Project Number: 5106	
Date: 9/07/01	
Developing Personnel: Derek Sandoz	
Purge Method: SUBMERSIBLE DIAD	

Purge Volume Calculation									
Static Water Level (ft)	Water Column (ft)	Conversion Factor (gal/foot)	1 Well Volume (gal)	10 Well Volumes (gal)					
25.5	¥7	0.17	1.5	15					
	Static Water Level (ft)	Static Water Water Column Level (ft) (ft)	Static Water Conversion Water Column Factor Level (ft) (ft) (gal/foot)	Static Water Conversion 1 Well Water Column Factor Volume Level (ft) (ft) (gal/foot) (gal)					

Well Pur	ge Data		Total Vo	lume to	Purge =			
Time	Volume Purged (gallons)	Conductivity (uS/cm) x100/x1000	Temperature degrees (C/F)	pН	Turbidity (NTU)	Dissolved Oxygen (%)	Redox Potential (%)	Comments
12.30	3	2 -17	611.0	((0		6.4	-177	2
13:30 13:40		3.73	84.0 78.7	6.65	N/5 N/5	7.3	-122	DICGRAY IMPROVING CLARITY
13,78	6.0	3.59	78.0	6.60	118.6	8.3	-085	MIRENING CLARITY
13.50	. •	3-76	80.2	6.80	103.7	6.8	-090	
22,31	9-0	3.67	77.9	6.23	874	6-7	-065	
14:15	13.0	3.60	76.1	6.56	23.6	6.9	-030	V
14:20	17.0	3.42	72.2	6.68	22.5	4.4	-046	DK:GRAY
14.28	18.0	3.38	71.2	E.84	21.5	4.5	-046	
						:		
								*
		-						

	 			 	
Purge Water Disposition				 	
Drum No.	 			 	

General Information	
Project Name: Marine Terminal 1 South	
HAI Project Number: 5106	
Date: 9/10/01	
Developing Personnel: Derek Sandoz	
Purge Method: SUBMERSIBLE PUMP	

me Calcul	ation		<u> </u>	
Static Water Level (ft)	Water Column (ft)	Conversion Factor (gal/foot)	1 Well Volume (gal)	10 Well Volumes (gal)
26,45	≅G	0.17	¥ 1	10
	Static Water Level (ft)	Water Column Level (ft) (ft)	Static Water Conversion Water Column Factor Level (ft) (ft) (gal/foot)	Static Water Conversion 1 Well Water Column Factor Volume Level (ft) (ft) (gal/foot) (gal)

2' well = 0.17 gallons/linear ft

4" well = 0.66 gallons/linear ft

Well Pur	ge Data		Total Vo	lume to	Purge =		-	
Time	Volume Purged (gallons)	Conductivity (uS/cm) x100/x1000	Temperature degrees (C/F)	рН	Turbidity (NTU)	Dissolved Oxygen (%)	Redox Potential (%)	Comments
0	0		-	_	-		-	
13:20	4	3.80	87.4	7 72	> 100	5.7	60	VERY DE GRAY, TURGED
13:30	G	3.89	87-2	7.03	69.2	6.7	-070	/
13:35	<u> පි</u>	3.96	86.4	7.68	03.7	6.7	-011	
13.40	13	3.92	85.2	7.23	-0.18	3.8	602	FLOW SLOWING, THICKERING
13:50	13	4.27	885	7.29	1.18	5,6	010	WELL PUMPED DRY @ 13 GALLOUS/ ALLOWED 5 MINS TO RECHAR
13:55	15	4.16	87,6	7.23	1:32	5.5	012_	ALLOWED 5 MINS TO RECHAR
								•
			 					
					:-			

Purge Water Disposition		
Drum No.		

General Information	
Project Name: Marine Terminal 1 South	
HAI Project Number: 5106	
Date: 9/6/01	
Developing Personnel: Derek Sandoz	
Purge Method: SUBMERSIBLE P	SW5

Purge Voli	ıme Calcul	ation) i		
Total Well Depth (ft)	Static Water Level (ft)	Water Column (ft)	Conversion Factor (gal/foot)	1 Well Volume (gal)	10 Well Volumes (gal)
34	26.68	<i>≅ 7</i>	0.17	≅ 1.25	12-5

Well Pur	ge Data		Total Vo	lume to:	Purge =		-:	
Time	Volume Purged (gallons)	Conductivity (uS/cm) x100/x1000	Temperature degrees (C/F)	РН	Turbidity (NTU)	Dissolved Oxygen (%)	Redox Potential (%)	Comments
2:35	3	7.65	66.0	6.77	190	7.4	-070	GRAY COLOR
2:40	5	2.06	66.6	6.90	168.9	11:2	-089	
2-45	7	2.02	65.7	6.61	170.1	7.0	-071	
2:50	9	1.99	65-2	6.82	147.1	10.2	-087	WELL IS NOW INSHADE PLUSARL CAUSE OF TEATS DRUP FROM NOW
3:00	11	1.97	65.9	6.62	148.9	10.4	-086	DROP FROM NOW
3:10	13	1,95	64,7	6.72	153.0	9.0	-084	
3:15	15_	1,99	657	6.71	149.9	9,1	-083	
							·	
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			·					
				-				
								

Purge Water Disposition	·	 	
Drum No.		 	

General Information	
Project Name: Marine Terminal 1 South	
HAI Project Number: 5106	
Date: 9/6/0/	
Developing Personnel: Derek Sandoz	<u>-</u>
Purge Method: Quanta TRIE	Ð

Purge Volu	une Calcul	ation			
Total Well Depth (ft)	Static Water Level (ft)	Water Column (ft)	Conversion Factor (gal/foot)	1 Well Volume (gal)	10 Well Volumes (gal)
32	22.17	±10	ي. 0.17	2 ga/	20

Volume Purged (gallons)	Conductivity (xis/cm) (x100) x1000	Temperature degrees (C/F)		Turbidity (NTU)	Dissolved Oxygen (%)	Redox Potential	Comments
2.	1.51	_			(78)	MV	
	1.51				-		
5		70.7	7.08	63.2	29.0	-006	
	2.15	74.0	6.50	29.4	19.2	-019	
_8	2.42	770	6-47	31.0	17.4	-107	
11	2.49	76.8	6.49	36.4	11-8	IUS	
14	2.38	73.3	6.51	67.2	24.3	-066	
17	2.38	75.3	6.47	87.4	133	-060	
225	2.50	758	6-55	>100	17.0	-065	·
2.5		-	-	>100	_	_	
30				>100			
3	2.03	81.2	6.23	178.9	17	-060	RETURNED TO WELL VERY
6	7.33	77.8	E.97	667	33.3	-064	UN LAMONE TURBIDITY (
9	2.32	17.3	6.84		34,3		-MOCHHIGHER CLARITY
#7_		76.9	6-85		343	1 - 1	
-	-						
\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	14 25 25 3 6	14 2.38 17 2.78 2.36 2.30 2.5 - 30 - 3 2.03 6 2.33 9 2.31 *2 2.31	11 2.49 76.8 14 2.38 73.3 17 2.78 75.3 10 25 75.8 25 30 2.03 81.2 10 72.32 17.3 11 2.31 76.9	11 2.49 76.8 6.49 14 2.38 73.3 6.51 17 2.78 75.3 6.47 2.36 2.50 75.8 6.55 2.5 30 3 2.03 81.2 6.23 6 2.33 77.8 5.97 19 2.31 76.9 6.85	11 2.49 76.8 6.49 36.4 14 2.38 73.3 6.51 67.2 17 2.38 75.3 6.47 87.4 2.36 2.50 75.8 6.55 >100 2.5 >100 30 >100 3 2.03 81.2 6.23 178.9 6 2.33 77.8 6.97 66.7 9 2.31 76.9 6.85 28.6	11 2.49 76.8 6.49 36.4 11.8 14 2.38 73.3 6.51 67.2 2.4.3 17 2.78 75.3 6.47 87.4 13.3 1.26 2.50 75.8 6.55 >100 17.0 1.25 >100 - 1.30 - >100 - 1.30 81.2 6.23 178.9 17 1.30 77.8 5.97 66.7 33.7 1.31 76.9 6.85 28.6 34.3	11 2.49 76.8 6.49 36.4 11.8 NS 14 2.38 73.3 6.51 67.2 24.3 -066 17 2.38 75.3 6.47 87.4 13.3 -060 26 2.50 75.8 6.55 >100 17.0 -065 25 >100 3 2.03 81.2 6.23 178.9 17 -060 6 2.33 77.6 6.97 66.7 33.3 -064 19 2.31 76.9 6.85 28.6 34.3 -050

Purge Water Disposition				
Drum No.				

General Information	
Project Name: Marine Terminal 1 South	
HAI Project Number: 5106	
Date: 9/6/01	
Developing Personnel: Derek Sandoz	
Purge Method: SugsuaniBLE Punp	

Purge Volu	ıme Calcul	<u></u> .			
Total Well Depth (ft)	Static Water Level (ft)	Water Column (ft)	Conversion Factor (gal/foot)	1 Well Volume (gal)	10 Well Volumes (gal)
32	Z9.54	≅ 3	0.17	¥.5	5

2' well = 0.17 gallons/linear ft

4" well = 0.66 gallons/linear ft

Well Pur	ge Data	· <u>-</u>	Total Vo	lume to	Purge=	· in		
Time	Volume Purged (gallons)	Conductivity (uS/cm) x100/x1000	Temperature degrees (C/F)	pН	Turbidity (NTU) メス <i>心</i>	Dissolved Oxygen (%)	Redox Potential (%)	Comments
0	٥	_	_		ţ		-	
1745	4	1.40	69.7	6.60	155,0	5.8	-096	VERY DK GRAY/BREWN
1755	7	1.38	68.6	6.66	129.8	7. j	-126	IMPROVING CLARITY
1800	8	1.36	68.6	6.69	126.8	7.3	-044	
1810	9	1.32	68.3	6.71	64.7	10.1	-049	√
1820	11	1.26	67.6	6.59	149.0	7,8	-050	GRAY OK BROWN AGAIN
1825	17	1.Zi	66.6	6.51	123.0	B.P	-051	IMPROVING CLARITY
1835	13	1.16	66.0	6.57	99.12	9.9	-054	
1340	14	1.10	65.1	661	108.7	9.7	~ 053	<u> </u>
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T-77020	 	 	 	
Purge Water Disposition	<u></u>		 · · ·	
Drum No.				

^{*} FLASH READINGS/LAMOTTE READER JUNEY

APPENDIX C

Port of Portland Well Elevation Survey

monwells.xls

T1 Monitoring Well Locations 2000UGEN 24232-730

Northing & Easting Coordinates are NAD 83/91, Oregon North Zone established from control points on POP drawing T1 2001-500 sheet 2/2. Elevations are NGVD 29/47, established from control points on POP drawing T1 2001-500 sheet 2/2.

				•	
Well#	Northing	Easting	Elevation North rim	Elevation PVC notch	Point#
MW-1	690210	7641039	30.68	30.39	213
MW-2	690371	7641181	28.45	28.16	212
MW-3	690494	7641288	27. 9 7	27.56	211
MW-4	689927	7641516	30.35	29.84	216
MW-5	690090	7641639	33.23	33.04	207
MW-6	689443	7641920	30.62	30.25	201
MW-7	689564	7642164	33:76	33.51	202

APPENDIX D

Laboratory Results and Chain-of-Custody Documentation: Soil Sample

P1H0861

HAHN AND ASSOCIATES, INC.		1	طم	orat	ory		M.	4.		CHA	IN OF C	CUS	STODY
Environmental Management										-			,
434 NW Sixth Avenue, Suite 203 • Portland OR 97209		1	ьb	Proje	et No.					Chain o	f Custody N	lo	
(503) 796-0717 • Fax (503) 227-2209 Project Manager (544 Tan 2	Г				<u> </u>		•		···				
Project Manager (my am 2 Project No. 5106		radi		Tost F		nt Samp	uc Test Sodin	nont	Tart Rock	Samples Received of Appropriate Conte		_	N)
Project Name 715		Mul	_		Sample		🕶			Provide Verbal Res		_	
Collected by Matt Mudge	١.				no twhich)		Test Sope	rately	Shoke	Provide Prelimina		_	YES
Sample Number Prefix:	M	atri	×			<u> </u>		Analyzes	to bo Performs	×d		T	
5106-0108	П					WETA		-				1	
PIEASE BELL PORT				Į		. 14		김				- [
PROJECT # 24232					χq	DOC	\mathcal{E}	Š				ŀ	
TASK # 730			Ì	Number of Container	1	ής 7.	82	82			•		
				ber of C	rPH	PRIORETY	2 2	22				H	
		Water	Og her	Num	75	3.75	2005 EP	E. T.				RUSH	
Lab ID Sample # Date Time Sample Description	ļ.,	- 1	_	_		12 '1	2	1,7	1 1	<u>:</u>	 ∔	4	Remarks
27-001 8 27 019:50 MW-10 25'	K	<u> </u>	\dashv	2		 	<u> </u>			 	11	1	
27-002 " 13:00 MW-7@ 25"	X		\perp	\perp		<u> </u>						4	
27-03 " 13.08 " 05	X		_	1		<u>. </u>							
28-004 6 2801 7:53 MW-6@5'	X	j		1	*	*	X	*			<u>i</u>		
78.005 " 16:12 MW-3@ 25"	X			Ī									
29-006 18 29 01 857 MV-7@ 25'	X			2								\Box	
29-007 " 11:00 MW-SE ZS'	X			Ĩ				<u></u>		!		\neg	
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Relinquished by Company HAHN & ASS	[_	Щ	Date			Time	<u> </u>	Received	by		Company		
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Redinguished Company NCA		\neg	Data (PC	,		Time	4	Brown	hille H	Stx	Company	R	
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Hahn and Associates, Inc.

Portland, OR 97209

434 NW Sixth Ave., Suite 203

Seattle 11720 North Creek Pkwy N, Suite 400, Bothell, WA 98011-8244

Seattle 11720 North Creek Pkwy N, Suite 400, Bothell, WA 98011-82 425.420.9200 tax 425.420.9210

Spoken East 11115 Montgomery, Suite B, Spokane, WA 99206-4776 509.924.9290 tax 509.924.9290

9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906.9200 fax 503.906.9210

Bend 2032 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588

REGEIVED SEP 2

Project: T1 South

Project Number: 5106

Project Manager: Guy Tanz

Reported:

09/18/01 12:24

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
5106-0108-28-004	P1H0861-04	Soil	08/28/01 07:53	08/31/01 07:39

North Creek Analytical - Portland

Lisa Domenighini, Project Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

> North Creek Analytical, Inc. **Environmental Laboratory Network**

I of 18



425.420.9200 fax 425.420.9210

Spokane East 1115 Montgomery, Suite B. Spokane, WA 99206-4776
509.924.9200 fax 509.924.9290

Portland 9005 SW Nimbus Avenue, Beaverton, OR 97008-7132

503.906.9200 fax 503.906.9210 Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588

Hahn and Associates, Inc.

434 NW Sixth Ave., Suite 203

Portland, OR 97209

Project: T1 South

Project Number: 5106

Project Manager: Guy Tanz

Reported: 09/18/01 12:24

Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-0108-28-004 (P1H0861-04) Soil			_		Sampled: 08/2	8/01 Rece	ived: 08/31/	01	
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	09/07/01	09/10/01	1091079	
Heavy Oil Range Hydrocarbons	ND	50.0	+	н		н	0		
Surr: 1-Chlorooctadecane	86.3 %	50-150					· ·		

North Creek Analytical - Portland

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Lisa Domenighini, Project Manager

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425.420.9700 fax 425.470.9210 East 11115 Montgomery, Suite 6, Spokane, WA 99208-4776 509.924.9200 fax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503-906-9200 fax 503-906-9210

Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541,383,9310 fax 541,382,7588

Hahn and Associates, Inc. 434 NW Sixth Ave., Suite 203

Portland, OR 97209

Project: T1 South

Project Number: 5106 Project Manager: Guy Tanz

Reported: 09/18/01 12:24

Total Metals per EPA 6000/7000 Series Methods

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	.Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-0108-28-004 (P1H0861-04) Soil				(Sampled: 08/2	8/01 Rece	ived: 08/31/	01	
Antimony	ND	0.500	mg/kg dry	1	EPA 6020	09/12/01	09/13/01	1091270	
Arsenic	3.37	0.500	•	n	н	**	09/13/01	n	
Beryllium	ND	0.500	•	10	ti .	n	-	н	
Cadmium	ND	0.500		**	11	•		11	
Chromium	15.8	0.500	•	••	*	7	09/13/01	**	
Copper	17.8	1.00	n	u		n	09/13/01	п	
Lead	20.4	0.500	11	10	*	11	77	44	
Mercury	ND	0.100	n	1	EPA 7471A	09/10/01	09/10/01	1091132	
Nickel	19.3	1.00	H	10	EPA 6020	09/12/01	09/13/01	1091270	
Selenium	ND	0.500	**	1	"	•	•	11	
Silver	ND	0.500	"	10	•	n	10	11	
Thallium	ND	0.500	*	1	•		u	•	
Zinc	50.9	2.50	•	10	7	*	w	w	

North Creek Analytical - Portland

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Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
509.924.9209 fax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132
503.906.9200 fax 503.906.9210

20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7508

Hahn and Associates, Inc.

434 NW Sixth Ave., Suite 203 Portland, OR 97209

Project: T1 South

Project Number: 5106 Project Manager: Guy Tanz Reported:

09/18/01 12:24

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared ·	Analyzed	Batch	Notes
5106-0108-28-004 (P1H0861-04) Soil				(Sampled: 08/2	8/01 Recei	ived: 08/31/0	01	
Acctone	ND	2500	ug/kg dry	1	EPA 8260B	08/31/01	09/04/01	1081973	
Benzene	ND	100	ŧi	n	17	n	н	п	
Bromobenzene	ND	100	Ħ		n	n	10		
Bromochloromethane	ND	100	n	*	n	n	10		
Bromodichloromethane	ND	100	n	•	**	11	11	•	
Bromoform	ND	100	r	r	•	п	-	п	•
Bromomethane	ND	500	17	•	n	-	я	n	
2-Butanone	ND	1000		•	•	*	19	n	
n-Butylbenzene	ND	500	**	"	11	*	**	"	
sec-Butylbenzene	ND	100	#	TI	u	**	**	. "	i
tert-Butylbenzene	ND	100	p	11	10	n	n	**	
Carbon disulfide	ND	1000		**	n	11	11	•	
Carbon tetrachloride	ND	100	**	-		**	п	n	
Chlorobenzene	ND	100	н		*	•	-	ri	
Chloroethane	ND	100	"	-	n		Ħ	n	
Chloroform	ND	100	•	п	п	n	h	11	
Chloromethane	ND	500	н	11	u	**	п	n	
2-Chlorotoluene	ND	100	77	n	•	н	*	a	
4-Chlorotoluene	ND	100	н	n	•		**	"	
1,2-Dibromo-3-chloropropane	ND	500	**	11	•	11	u	-	
Dibromochloromethane	ND	100	It	n	•	*	•		
1.2-Dibromoethane	ND	100	11		n	H		**	
Dibromomethane	ND	100	•	-	n	•	,	**	
1.2-Dichlorobenzene	ND	100	•	11	н	ti ti	#	•	
1.3-Dichlorobenzene	ND	100	11	n		"	. 0	r .	
1,4-Dichlorobenzene	ND	100	•	н	n		11	n	
Dichlorodifluoromethane	ND	500	**	11	п	и	n .	n	
I.1-Dichloroethane	ND	100	**			*	11	-	
1.2-Dichloroethane	ND	100	n		•	•	*	7	
1.1-Dichloroethene	ND	100	n	•	11	*	-	er er	
cis-1,2-Dichloroethene	ND	100	•		13	11	n	tr	
trans-1,2-Dichloroethene	ND	100	w	**	4	11	11		
1,2-Dichloropropane	ND	100	н	**	n	*	11		
1,3-Dichloropropane	ND	100	n		11	•	n	П	
2,2-Dichloropropane	ND	100	n		м	**	11	•	
1,1-Dichloropropene	ND	100	*	#	•				
cis-1,3-Dichloropropene	ND	100			*	•	•		
trans-1,3-Dichloropropene	ND	100		70		13	•	*	
Ethylbenzene	ND	100		••	и .	11	н	H	
and to the contraction	,112	.00							

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Lisa Domenighini, Project Manager

North Creek Analytical, Inc. Environmental Laboratory Network



425.420.9200 1ax 425.420.9210

Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
509.924.9200 1ax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132

503.906.9200 fax 503.906.9210

Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541,383,9310 fax 541,382,7588

Hahn and Associates, Inc.

434 NW Sixth Ave., Suite 203 Portland, OR 97209

Project: T1 South

Project Number: 5106 Project Manager: Guy Tanz Reported:

09/18/01 12:24

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-0108-28-004 (P1H0861-04) Soil				,	Sampled: 08/2	8/01 Rece	ived: 08/31/0	01	
Hexachlorobutadiene	ND	200	ug/kg dry	ı	EPA 8260B	08/31/01	09/04/01	1081973	
2-Hexanone	ND	1000		п	**	,	-	•	
Isopropylbenzene	ND	200	0	41	**	1)	•	11	
p-Isopropyltoluene	ND	200	tī .	11			*	11	
4-Methyl-2-pentanone	ND	500	10	n	*	77	**	"	
Methyl tert-butyl ether	ND	100	п	Ħ	n	•	11	79	
Methylene chloride	ND	500	•		n	•	11	4	
Naphthalene	ND	200	•	P	**	n	n	11	
n-Propylbenzene	ND	100	•	•	**	Ħ	*	11	
Styrene	αи	100	•	h	ч	n	11	14	
1,1,1,2-Tetrachloroethane	ND	100	**	17	*	π			
1,1,2,2-Tetrachloroethane	ND	100	Ħ	11	. •			13	
Tetrachlorocthene	ND	100	н	-	•	×	11	*	
Toluene	ND	100	n	#	**	*	n		
1,2,3-Trichlorobenzene	ND	100	н	~	11	**	π		
1,2,4-Trichlorobenzene	ND	100	•	₩	19	"	#	•	
1,1,1-Trichloroethane	ND	100	Ħ	*	n	"	-	44	
1,1,2-Trichloroethane	ND	100	u	•	•	*	•	u	
Trichloroethene	ND	100	n	, II		ø	•	11	
Trichlorofluoromethane	ND	100	.,	**	•	-	-	**	
1,2,3-Trichloropropane	ND	100		ø	11	•	**		
1,2,4-Trimethylbenzene	ND	100	•		11	■	11	υ	
1,3,5-Trimethylbenzene	ND	100	•	11	a	n	n		
Vinyl chloride	ND	100	•	11	tr.	, u	**	u	
o-Xylene	ND	100	*	μ		n	**	ij	
m,p-Xylene	ND	200		n		h			
Surr: 4-BFB	97.6 %	70-130							
Surr: 1,2-DCA-d4	100 %	70-130							
Surr: Dibromofluoromethane	99.1%	70-130							
Surr: Toluene-d8	100 %	70-130							

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Lisa Domenighini, Project Manager

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Seattle 11720 North Creek Pkwy N, Suite 409, Bathell, WA 98011-8244 425.420.9200 fax 425.420.9210

425.420.9200 1ax 325.420.9210 East 11115 Montgomery, Suite B. Spokane, WA 99206-4776 509.924.9200 fax 509.924.9290 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906.9200 fax 503.906.9210

Portland

20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383,9310 fax 541.382,7588

Hahn and Associates, Inc.

434 NW Sixth Ave., Suite 203 Portland, OR 97209

Project: T1 South

Project Number: 5106 Project Manager: Guy Tanz Reported:

09/18/01 12:24

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-0108-28-004 (P1H0861-04) Soil					Sampled: 08/2	8/01 Rece	ived: 08/31/	01	R-05
Acenaphthene	ND	26.8	ug/kg dry	2	EPA 8270m	09/10/01	09/13/01	1091165	
Acenaphthylene	ND	26.8	•	*	*	n	•	*	
Anthracene	ND	26.8	ĸ	n	*	•	•	u	
Benzo (a) anthracene	ND	26.8	p	н	•	n	11	#	
Benzo (a) pyrene	ND	26.8	••	n	**	17	11	•	
Benzo (b) fluoranthene	ND	26.8	11	d	n		u	n	
Benzo (ghi) perylene	ND	26.8	13	•	n	u	IT	•	
Benzo (k) fluoranthene	ND	26.8	•	•	п		•	**	
Chrysene	ND	26.8	•	**	•	•	•	*	
Dibenzo (a,h) anthracene	ND	26.8	11	n	•	77	•	H	
Fluoranthene	ND	26.8	•	n	*	n	•	٠	
Fluorene	ND	26.8	**		n	w	"	•	
Indeno (1,2,3-cd) pyrene	ND	26.8	11	7	•	u	17	đ	
Naphthalene	ND	26.8	•	•	11	4	*	4	
Phenanthrene	ND	26.8	-	ti	79	•	•	٠	
Рутепе	ND	26.8	11	*		п	- "	H	
Surr: Fluorene-d10	53.2 %	40-150			-				
Surr: Pyrene-d10	78.2 %	40-150							
Surr: Benzo (a) pyrene-d12	54.4 %	40-150							

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541.383.9310 fax 541.382.7588

Hahn and Associates, Inc.

Portland, OR 97209

434 NW Sixth Ave., Suite 203

Project: T1 South

Project Number: 5106 Project Manager: Guy Tanz Reported:

09/18/01 12:24

Percent Dry Weight (Solids) per Standard Methods

North Creek Analytical - Portland

Analyte	Result	Reporting Limit Un	ts Dilution	n Method	Prepared	Analyzed	Batch	Notes
, 5106-0108-28-004 (P1H0861-04) Soil				Sampled: 08/2	28/01 Rece	ived: 08/31/	01	
% Solids	94.2	1.00 % by V	/eight l	NCA SOP	09/10/01	09/11/01	1091153	

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: Lisa Domenighini, Project Manager

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Seattle 11720 North Creek Pkwy N, Suite 400, Bothell, WA 98011-8244 425.420.9200 fax 425.420.9210

East 11115 Montgomery, Suite B, Spokane, WA 99206-4776 509.924.9200 fax 509.924.9290 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132

503.906.9200 fax 503.906.9210

20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541,383,9310 fax 541,382,7588

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Project: T1 South

Project Number: 5106 Project Manager: Guy Tanz Reported:

09/18/01 12:24

Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method Quality Control

North Creek Analytical - Portland											
Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC_	%REC Limits	RPD	RPD Limit	Notes	
Batch 1091079 - EPA 3550 Fuels											
Blank (1091079-BLK1)				Prepare	:d: 09/07/0	1 Analyz	ed: 09/10/0)1			
Diesel Range Organics	ND	25.0	mg∕kg								
Heavy Oil Range Hydrocarbons	ИО	50.0	М								
Surr: 1-Chlorooctadecane	4.28		д	4.80		89.2	50-150				
LCS (1091079-BS1)				Prepare	d: 09/07/0	l Analyz	ed: 09/10/0	01			
Diesel Range Organics	103	25.0	mg/kg	129		79.8	50-150				
Heavy Oil Range Hydrocarbons	59.7	50.0	•	79.0		75.6	50-150				
Surr: 1-Chlorooctadecane	3.85		n	4.80		80.2	50-150				
Duplicate (1091079-DUP1)	Sour	rce: P1H07	83-02	Prepare	d: 09/07/0	l Analyz	ed: 09/10/0	01			
Diesel Range Organics	ND	125	mg/kg dry		ND				50	•	
Heavy Oil Range Hydrocarbons	1360	250	*		1160			15.9	50		
Surr: 1-Chlorooctadecane	5.73		,	6.34	-	90.4	50-150				
Duplicate (1091079-DUP2)	Sour	rce: P11014	12-01	Ргераге	d: 09/07/0	l Analyz	ed: 09/11/0	01			
Diesel Range Organics	7060	1000	mg/kg dry		11600			48.7	50		
Heavy Oil Range Hydrocarbons	10700	2000	77		00081			50.9	50	Q-14	
Surr: 1-Chlorooctadecane	0.00		"	5.59			50-150		-	S-0.	

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Seattle 11720 North Creek Pkwy N, Suite 400, Bothell, WA 98011-8244 425.420.9200 fax 425.420.9210 Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776 509.924.9200 fax 509.924.9290

Spokane

9405 SW Nimbus Avenue, Beaverton, OR 97008-7132

503,905,9700 fax 503,906,9210 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5713

541.383.9310 fax 541.382.7588

Hahn and Associates, Inc.

434 NW Sixth Ave., Suite 203 Portland, OR 97209

Project: T1 South

Project Number: 5106 Project Manager: Guy Tanz Reported:

09/18/01 12:24

Total Metals per EPA 6000/7000 Series Methods - Quality Control &

	Nort	h Creek	Analyti	ical - Pe	ortland		······································			
		Reporting		Spike	Source		%REC		RPD	
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 1091132 - EPA 7471										
Blank (1091132-BLK1)				Prepare	d & Analy	zed: 09/10	0/01			
Mercury	ND	0.100	mg/kg							
LCS (1091132-BS1)				Prepare	d & Analy	/zed: 09/1	0/01			
Mercury	0.958	0.100	mg/kg	1.00		95.8	80-120			
Duplicate (1091132-DUP1)	Sour	rce: P11018	37-02	Prepare	d & Analy	/zed: 09/1	10/0	•		
Mercury	ND	0.100	mg/kg dry		ND			20.4	40	
Matrix Spike (1091132-MS1)	Soui	rce: P11018	37 - 02	Prepare	d & Analy	zed: 09/1	0/01			
Mercury	0.985	0.100	mg/kg dry	1.04	ND	91.7	75-125			
Batch 1091270 - EPA 3050										
Blank (1091270-BLK1)				Prepare	:d: 09/12/0) I Analyz	ed: 09/13/	 D1		-
Antimony	ND	0.500	mg/kg							
Arsenic	ND	0.500								
Beryllium	ND	0.500	n							
Cadmium	ND	0.500	**							
Chromium	ND	0.500	, n							
Copper	ND	1.00	•							
Lead	ND	0.500	н							
Nickel	ND	1.00								
Selenium	ND	0.500	•							
Silver	ND	0.500	7							
Thallium	ND	0.500	н							

ND

2.50

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Zinc



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East 11115 Montgomery, Suite B, Spokane, WA 99206-4776 509.924.9200 fax 509.924.9290

503.945.900 13x 503.324.320 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906.9200 1ax 503.906.9210 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 1ax 541.382.7588

Bend

Hahn and Associates, Inc.

434 NW Sixth Ave., Suite 203 Portland, OR 97209

Project: T1 South

Project Number: 5106 Project Manager: Guy Tanz Reported:

09/18/01 12:24

Total Metals per EPA 6000/7000 Series Methods = Quality Control

		Reporting		Spike	Source		%REC		RPD	ļ
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch	1091270 -	EPA 3050

LCS (1091270-BS1)				Prepared: 09	0/12/01 Analyze	ed: 09/13/01	
Antimony	5.34	0.500	mg/kg	5.00	107	80-120	
Arsenic	9.98	0.500	n	10.0	99.8	80-120	
Beryllium	9.60	0.500	n	10.0	96.0	80-120	
Cadmium	10.3	0.500	•	10.0	103	80-120	
Chromium	10.9	0.500	*	10.0	109	80-120	
Copper	10.3	1.00	н	10.0	103	80-120	
Lead	9.88	0.500		10.0	98.8	80-120	
Nickel	10.3	1.00	"	10.0	103	80-120	
Selenium	10.4	0.500	17	10.0	104	80-120	
Silver -	4.92	0.500	-	5.00	98.4	80-120	
Thallium	4.68	0.500	•	5.00	93.6	80-120	
Zinc	10.9	2.50	. "	10.0	109	80-120	

Duplicate (1091270-DUP1)	Sour	ce: P1H0861	I <i>-</i> 04	Prepared: 09/12/01 Analyzed	1: 09/13/01		
Antimony	ND	0.500 m	g/kg dry	ND	44.4	40	Q-06
Arsenic	4.34	0.500	"	3.37	25.2	40	
Beryllium	ND	0.500	-	ND	43.8	40	Q-06
Cadmium	ND	0.500	"	ND		40	
Chromium	16.6	0.500		15.8	4.94	40	
Copper	22.4	1.00		17.8	22.9	40	
Lead	26.3	0.500	-	20.4	25.3	40	
Nickel	24.9	1.00	•	19.3	25.3	40	
Selenium	ND	0.500	**	ND	35.8	40	Q-06
Silver	ND	0.500	P	ND	40.3	40	Q-06
Thallium	ND	0.500		ND	62.9	40	Q-06
Zinc	65.1	2.50	ti	50.9	24.5	40	

Matrix Spike (1091270-MS1)	Sour	rce: P1H08	361-04	Prepare	d: 09/12/0	l Analyz	ed: 09/13/01	
Antimony	2.77	0.500	mg/kg dry	5.31	ND	51.1	75-125	Q-07
Arsenic	15.1	0.500	•	10.6	3.37	111	75-125	
Beryllium	11.6	0.500	4	10.6	ND	107	75-125	
Cadmium	11.4	0.500	•	10.6	ND	108	75-125	
Chromium	25.8	0.500	•	10.6	15.8	94.3	75-125	
Copper	29.7	1.00	•	10.6	17.8	112	75-125	Q-07
Lead	28.4	0.500	\$1	10.6	20.4	75.5	75-125	Q-07
Nickel	32.8	1.00	11	10.6	19.3	127	75-125	Q-07

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Lisa Domenighini, Project Manager

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Seattle 11720 North Creek Pkwy N, Suite 400, Bothell, WA 98011-8244
425.420.9200 tax 425.420.9210
Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
509.924.9200 tax 509.924.9290
Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132
503.906.9200 tax 503.906.9210

Spokane

20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711

541.383.9310 fax 541.382.7588

Hahn and Associates, Inc.

434 NW Sixth Ave., Suite 203 Portland, OR 97209

Project: T1 South

Project Number: 5106 Project Manager: Guy Tanz Reported:

09/18/01 12:24

Total Metals per EPA 6000/7000 Series Methods - Quality Control

Nor	th Creek	Analyt	ical - Po	rtland					
Daniela	Reporting	TT '	Spike	Source	0/BEC	%REC	RPD	RPD Limit	Mana
Result	Limit	Units	Level	Result	%REC	Limits	KPD	Limit	Notes

Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 1091270 - EPA 3050										
Matrix Spike (1091270-MS1)	Sour	rce: P1H08	61-04	Prepare	d & Analy	zed: 09/1	2/01			
Selenium	11.9	0.500	mg/kg dry	10.6	ND	110	75-125			
Silver	5.43	0.500	11	5.31	ND	102	75-125			
Thallium	5.32	0.500	u	5.31	ND	99.1	75-125			
Zinc	63.9	2.50	•	10.6	50.9	123	75-125			Q-03
Matrix Spike (1091270-MS2)	Sou	rce: P11018	3-04	Prepare	d: 09/12/0) Analyz	ed: 09/13/	01		
Antimony	3.27	0.500	mg/kg dry	6.59	ND	46.9	75-125			Q-07
Arsenic	19.4	0.500	n	13.2	5.43	106	75-125			
Beryllium	16.0	0.500	н	13.2	0.923	114	75-125			
Cadmium	14.9	0.500	d	13.2	ND	113	75-125			
Chromium	49.9	0.500	#	13.2	33.8	122	75-125			
Copper	50.2	1.00	n	13.2	59.9	NR	75-125			Q-03
Lead	28.8	0.500	ıt	13.2	16.1	96.2	75-125			
Nickel	45.6	00.1	*	13.2	36.9	65.9	75-125			Q-01
Selenium	15.9	0.500	•	13.2	0.747	115	75-125			
Silver	7.46	0.500	H	6.59	ND	111	75-125			
Thallium	7.34	0.500	**	6.59	ND	109	75-125			
Zinc .	113	2.50	\$1	13.2	117	NR	75-125			Q-0:

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Lisa Domenighini, Project Manager

North Creek Analytical, Inc. **Environmental Laboratory Network**



503.906.9200 fax 503.906.9210 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588

Hahn and Associates, Inc.

Portland, OR 97209

434 NW Sixth Ave., Suite 203

Project: T1 South

Project Number: 5106 Project Manager: Guy Tanz Reported:

09/18/01 12:24

Sevolatile Organic Compounds per EPA Method 8260B - Quality Control

North Creek Analytical - Portland

	Report	ng	Spike	Source	%REC		RPD	
Analyte		nit Units	Level .	Result . %REC	Limits	KPD I	Limit	Notes

Datab	1021073	TO TO A	E025
Rairn	1481074	_ H:νΔ	~ II I ~

Blank (1081973-BLK1)				Prepared: 08/31/01 Analyzed: 09/03/01
Acetone	ND	2500	ug/kg	
Benzene	ND	100	н	•
Bromobenzene	ND	100	"	
Bromochloromethane	ND	001	**	
Bromodichloromethane	ND	100	•	
3romoform	ND	100	r	
Bromomethane	ND	500	7	
2-Butanone	ND	1000	•	
1-Butylbenzene	ND	500	•	
ec-Butylbenzene	ND	100	*1	•
ert-Butylbenzene	ND	100	*1	
Carbon disulfide	ND	1000	"	
Carbon tetrachloride	ND	100	**	
Chlorobenzene	ND	100	H	
Chloroethane	ND	100	*	
Chloroform	ND	100	u	
Chloromethane	ND	500	л	
2-Chlorotoluene	ND	100		
1-Chlorotoluene	ND	100	•	
,2-Dibromo-3-chloropropane	ND	500	•	
Dibromochloromethane	ND	100	7	
1,2-Dibromoethane	ND	100	•	
Dibromomethane	ND	100		
1,2-Dichlorobenzene	ND	100	**	
1,3-Dichlorobenzene	ND	100		
1,4-Dichlorobenzene	ND	100	"	
Dichlorodifluoromethane	ND	500	*	
,1-Dichloroethane	ND	100	79	
1,2-Dichloroethane	ND	100	16	
I,I-Dichloroethene	ND	100	11	
cis-1,2-Dichloroethene	ND	100	,	
rans-1,2-Dichloroethene	ND	100	-	
1,2-Dichloropropane	ND	100	•	
1,3-Dichloropropane	ND	100	*	
2,2-Dichtoropropane	ND	100	11	
1,1-Dichloropropene	ND	100	n	

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North Creek Analytical, Inc. **Environmental Laboratory Network**



 Seattle
 11720 North Creek Pkwy N, Suite 400, Bothell, WA 98011-8244

 425.420.9200
 fax 425.420.9210

 Spokane
 East 11115 Montgomery, Suite B, Spokane, WA 99206-4776

509.924.9200 fax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132
503.906.9200 fax 503.906.9210

Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541,383,9310 fax 541,382,7588

Hahn and Associates, Inc.

Portland, OR 97209

434 NW Sixth Ave., Suite 203

Project: T1 South

Project Number: 5106 Project Manager: Guy Tanz

Reported: 09/18/01 12:24

Volatile Organic Compounds per EPA Method 8260B - Quality Control

North Creek Analytical - Portland

	 										1
		Reporting		Spike	Source		%REC		RPD		
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes	l

Datch	1081973	_ FDA	5035
Baich	111217/3	- r.ra	71117

Blank (1081973-BLK1)				Prepared: 08/31/01 Analyzed: 09/03/01	
cis-1,3-Dichloropropene	ND	100	ug/kg		
trans-1,3-Dichloropropene	ND	100	41		
Ethylbenzene	ND	100	"		
Hexachlorobutadiene	ND	200			
2-Hexanone	ND	1000			
Isopropylbenzene	ND	200	**		
p-Isopropyltoluene	ИD	200	н		
4-Methyl-2-pentanone	ND	500	n		
Methyl tert-butyl ether	ND	100	н		
Methylene chloride	ND	500	n		
Naphthalene	ND	200			
n-Propylbenzene	ND	100	n		
Styrene	ND	100	•		
1,1,1,2-Tetrachloroethane	ND	100	11		
1,1,2,2-Tetrachloroethane	ND	100	••		
Tetrachloroethene	ND	100			
Toluene	ND	100			
1,2,3-Trichlorobenzene	ND	100	"	·	
1,2,4-Trichlorobenzene	ND	100	11		
1,1,1-Trichloroethane	ND	100	**		
1,1,2-Trichloroethane	ND	100			
Frichloroethene	ND	100	-		
Trichlorofluoromethane	ND	100	•		
1,2,3-Trichloropropane	ND	100	11		
1,2,4-Trimethylbenzene	ND	100	ti		
1,3,5-Trimethylbenzene	ИD	100	n		
Vinyl chloride	ND	100	•		
o-Xylene	ND	100	•		
m,p-Xylene	ND	200			
Surr: 4-BFB	2170		u	2000 108 70-130	
Surr: 1,2-DCA-d4	2030		"	2000 102 70-130	
Surr: Dibromofluoromethane	2120		"	2000 106 70-130	
Surr: Toluene-d8	2020		,	2000 101 70-130	

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503.906.9200 fax 503.906.9210

20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711

541.383.9310 fax 541.382.7588

Hahn and Associates, Inc.

434 NW Sixth Ave., Suite 203 Portland, OR 97209

Project: Ti South

Project Number: 5106 Project Manager: Guy Tanz Reported:

09/18/01 12:24

Volatile Organic Compounds per EPA Method 8260B Quality Control

North Creek Analytical - Portland										
Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1081973 - EPA 5035								····		
LCS (1081973-BS1)				Prepare	d: 08/31/0	1 Analyz	ed: 09/03/0)1		
Benzene	2440	100	ug/kg	2500		97.6	80-135			
Chlorobenzene	2260	100	10	2500		90.4	80-135			
1,1-Dichloroethene	2650	100	11	2500		106	60-150			
Toluene	2310	100	U	2500		92.4	80-130			
Trichloroethene	2260	100	n	2500		90.4	70-135			
Surr: 4-BFB	2080		n	2000		104	70-130			
Surr: 1,2-DCA-d4	2080		Ħ	2000		104	70-130			
Surr: Dibromofluoromethane	2120			2000		106	70-130			
Surr: Toluene-d8	2060		#	2000		103	70-130			
Matrix Spike (1081973-MS1)	Sou	arce: P1H08	49-01	Prepare	:d: 08/31/0	1 Analyz	ed: 09/03/0) [
Benzene -	2480	100	ug/kg dry	2810	ND	88.3	60-135	.,		
Chiorobenzene	2450	100	и	2810	ND	87.2	65-125			
1,1-Dichloroethene	2520	100	•	2810	ND	89.7	60-135			
Toluene	2420	100	*	2810	ND	86.1	60-125			
Trichlomethene	2320	100	•	2810	ДИ	82.6	60-125			
Surr: 4-BFB	2060		"	2250		91.6	70-130			<u>-</u>
Surr: 1,2-DCA-d4	2070		"	2250		92.0	70-130			
Surr: Dihromofluoromethane	2070		~	2250		92.0	70-130			
Surr: Toluene-d8	2030		,	2250		90.2	70-130			
Matrix Spike Dup (1081973-MSD1)	Ser	urce: P1H08	49-01	Prepare	ed: 08/31/0	l Analyz	ed: 09/03/	01		
Benzene	2650	100	ug/kg dry	2810	ND	94.3	60-135	6.63	25	
Chlorobenzene	2540	100	•	2810	ND	90.4	65-125	3.61	25	
1,1-Dichloroethene	2650	100	•	2810	ND	94.3	60-135	5.03	25	
Foluene	2530	100		2810	ND	90.0	60-125	4.44	25	
Frichloroethene	2450	100	u u	2810	ND	87.2	60-125	5.45	25	
Surr: 4-BFB	2160		77	2250		96.0	70-130			
Surr: 1.2-DCA-d4	2100		n	2250		93.3	70-130			

2250

2250

2180

2140

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Surr: Dibromofluoromethane

Surr: Toluene-d8

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70-130

70-130

96.9

95.1

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North Creek Analytical, Inc. **Environmental Laboratory Network**



Seattle 11720 North Creek Pkwy N, Suita 400, Bothell, WA 98011-8244 425.420.9200 fax 425.420.9210

East 11115 Montgomery, Suite B, Spokane, WA 99206-4776 509.924.9200 fax 509.924.9290 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132

503.906.9200 fax 503.906.9210

20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588

Hahn and Associates, Inc.

434 NW Sixth Ave., Suite 203

Portland, OR 97209

Project: T1 South

Project Number: 5106

Project Manager: Guy Tanz

Reported:

09/18/01 12:24

Polynuclear Aromatic Compounds per EPA 8270M-SIM-- Quality Control

North Creek Analytical - Portland

·		Reporting		Spike	Source		%REC		RPD	
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch	1()9	1	16	5 -	EPA	3550
-------	----	----	---	----	-----	-----	------

Batch 1091165 - EPA 3550							
Blank (1091165-BLK1)				Prepared: 09	/10/01 Analyza	ed: 09/12/01	
Acenaphthene	ND	13.4	ug/kg				
Acenaphthylene	ND	13.4	•				
Anthracene	ND	13.4	Ħ				
Benzo (a) anthracene	ND	13.4	n				
Benzo (a) pyrene	ND	13.4	M				
Benzo (b) fluoranthene	ND	13.4	H				
Benzo (ghi) perylene	ND	13.4	•				
Benzo (k) fluoranthene	ND	13.4	•				
Chrysene	ND	13.4	•				
Dibenzo (a,h) anthracene	ND	13.4	11				
Fluorauthene	ND	13.4	11				
Fluorene	ND	13.4	н				
Indeno (1,2,3-cd) pyrene	ND	13.4	.,				
Naphthalene	ND	13.4	**				
Phenanthrene	ND	13.4	•				
Рутспе	ND	13.4	•				
Surr: Fluorene-d10	49.9		,,	82.6	60.4	40-150	
Surr. Pyrene-d10	80.1		"	83.3	96.2	40-150	
Surr: Benzo (a) pyrene-d12	44.3		"	82.0	54.0	40-150	
LCS (1091165-BS1)				Prepared: 09	0/10/01 Analyz	ed: 09/12/01	
Acenaphthene	112	13.4	ug/kg	167	67.1	33-139	
Benzo (a) pyrene	114	13.4	17	167	68.3	45-149	
′ Рутепе	136	13.4	#	167	81.4	39-138	
Surr: Fluorene-d10	50.9		~	82.6	61.6	40-150	
Surr: Pyrene-d10	82.1		n	83.3	98.6	40-150	
⁵ Surr: Benzo (a) pyrene-d12	47.6		•	82.0	58.0	40-150	

North Creek Analytical - Portland

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Seattle 11720 North Creek Pkwy N, Suite 400, Bothell, WA 98011-9244 425,420,9200 fax 425,420,9210
Spokane East 11115 Montgomery, Suite B, Spokane, WA 99205-4776 509,924,9290 fax 509,924,9290
Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503,906,9200 fax 503,906,9210
Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541,183,931,647,541,847,2588

Spokane

Portland

541.383.9310 fax 541.382.7588

Hahn and Associates, Inc.

434 NW Sixth Ave., Suite 203 Portland, OR 97209

Project: T1 South

Project Number: 5106 Project Manager: Guy Tanz Reported:

09/18/01 12:24

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Quality Control

North Creek Analytical - Portland

			Reporting		Spike	Source		%REC		RPD	
Analyte	·	Result	Limit	Units	Level	Result .	%REC	Limits	RPD	Limit	Notes

Batch	1091	165 -	EPA	3550
-------	------	-------	------------	------

Matrix Spike (1091165-MS1)	Sour	ce: P1H08	60-03	Ргераге	d: 09/10/0	i Analya	ed: 09/13/0	1		R-05
Acenaphthene	128	26.8	ug/kg dry	182	ND	65.2	33-139			
Benzo (a) pyrene	244	26.8	"	182	441	NR	45-149			Q-14
Рутепе	371	26.8	**	182	1360	NR	39-138			Q-14
Surr: Fluorene-d10	72.8		,	90.1		80.8	40-150			
Surr: Pyrene-d10	78.9			90.9		86.8	40-150			
Surr: Benzo (a) pyrene-d12	51.5		•	89.5		<i>57.5</i>	40-150			
Matrix Spike Dup (1091165-MSD1)	Sour	ce: P1H08	360-03	Prepare	d: 09/10/0	l Analy:	zed: 09/13/0)1		R-05
Acenaphthene	148	26.8	ug/kg dry	182	ND	76.2	33-139	14.5	60	
Benzo (a) pyrene	1660	53.6	•	182	441	NR	45-149	149	60	Q-14
Pyrene	1140	26.8	*	182	1360	NR	39-138	102	60	Q-14
Surr: Fluorene-d10	67.5		"	90.1		74.9	40-150			
Surr: Pyrene-d10	96.8		7	90.9		106	40-150			
Surr: Benzo (a) pyrene-d12	55.6		~	89.5		62.1	40-150			

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425.420.9200 fax 425.420.9210 East 11115 Montgomery, Suite B, Spokane, WA 99205-4776 509.924.9200 fax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132

503.906.9200 fax 503.906.9210

20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711

541.383.9310 fax 541.382.7588

Hahn and Associates, Inc. 434 NW Sixth Ave., Suite 203 Portland, OR 97209

Project: T1 South Project Number: 5106 Project Manager: Guy Tanz

Reported: 09/18/01 12:24

Percent Dry Weight (Solids) per Standard Methods - Quality Control North Creek Analytical - Portland RPD Reporting Spike %REC Analyte Result Limit Units Level Result %REC Limits RPD Limit Notes Batch 1091153 - Dry Weight Prepared: 09/10/01 Analyzed: 09/11/01 Duplicate (1091153-DUP1) Source: P1H0811-01 96.0 2.85 20 % Solids 1.00% by Weight 93.3 Prepared: 09/10/01 Analyzed: 09/11/01 **Duplicate (1091153-DUP2)** Source: P110004-05 % Solids 20 80.1 1.00 % by Weight 92.9 14.8 Duplicate (1091153-DUP3) Source: P110009-03 Prepared: 09/10/01 Analyzed: 09/11/01 % Solids 70.4 1.00 % by Weight 0.567 20 Prepared: 09/10/01 Analyzed: 09/11/01 Duplicate (1091153-DUP4) Source: P1I0159-03 1.00 % by Weight 20 79.2 79.1 0.126 Duplicate (1091153-DUP5) Source: P110172-06 Prepared: 09/10/01 Analyzed: 09/11/01 % Solids 87.7 1.00 % by Weight 1.96 20 86.0

North Creek Analytical - Portland

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North Creek Analytical, Inc. Environmental Laboratory Network



425.420.9200 fax 425.420.9210
East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
509.924.9200 fax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503 906.9200 fax 503.906 9210

Bend 20332 Empire Avenue, Suite F-t, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588

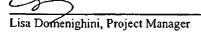
Hahn and Associates, Inc. Project: T1 South 434 NW Sixth Ave., Suite 203 Project Number: 5106 Reported: Portland, OR 97209 09/18/01 12:24 Project Manager: Guy Tanz

Notes and Definitions

	Notes and Definitions
Q-03	The RPD and/or percent recovery for this QC spike sample cannot be accurately calculated due to the high concentration of analyte already present in the sample.
Q-06	Analyses are not controlled on RPD values from sample concentrations less than 5 times the reporting limit.
Q-07	The recovery of this spike is outside control limits due to sample dilution required from high analyte concentration and/or matrix interferences.
Q-14	The Spike Recovery and/or RPD is outside of control limits due to a non-homogeneous sample matrix.
R-05	Reporting limits raised due to dilution necessary for analysis. Sample contains high levels of reported analyte, non-target analyte, and/or matrix interference.
S-01	The surrogate recovery for this sample is not available due to sample dilution required from high analyte concentration and/or matrix interferences.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis. MRLs are adjusted if %Solids are less than 50%.
wet	Sample results reported on a wet weight basis (as received)
RPD	Relative Percent Difference

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North Creek Analytical, Inc. **Environmental Laboratory Network**

APPENDIX E

Laboratory Results and Chain-of-Custody Documentation: September/October 2001 Groundwater Monitoring Samples

HAHN AND ASSOCIATES, INC.	Lab	oratory	NCA at 2	CHAIN OF CUSTODY
Environmental Management	·		REGEIVED OCT 2.	
434 NW Sixth Avenue, Suite 203 • Portland OR 97209	Labl	Project No.	DECEIAL	Chain of Custody No.
(503) 796-0717 • Fax (503) 227-2209 Project Manager 7W [QUZ	1:-4-	with Sodiment S		Complete Production of the Complete Production o
Project No. 505	7	oot Filtrate	=	Samples Received at 4C (Y or N) Appropriate Containers Used (Y or N)
Project Name T15	Multi-Pi	hase Sample	 ·	Provide Verbal Results (Y or N)
Collected by Matt Mudge	T	est One (which)	Test Separately Shoke	Provide Preliminary Fex Results YES
Sample Number Prefix:	Matrix		Analyses to be Performs	d
5106-010928-			2 3	250
BILL PORT OF PORTLAND			ST. 20	130 J
			の表が発える	3.4.2
		18分子	12 10 17 17 17 17 17 17 17 17 17 17 17 17 17	O HOY
		\$ 12 JE	10 00 HO 3	15 39 0
	Soil Water Other	3 1	A A A A A A A A A A A A A A A A A A A	A C HRUSH
Lab ID Sample # Dato Time Sample Description	1 1 1 1	N	EPA 83 EPA 82 EPA 601 EPA 601	Remarks
101 9 28010 800 Trio Rlank	XI 4	4		HOLD
102 1 11:24 MW-5	X 1	4	* * *	*
103 13:12 MW-3	XL	7	* * *	*
104 14:25 MM-4	X	8 * *		* *
105 V 15:30 MW-6		5	* * * *	*
·				
	"			
			 	
		-		-
		+ +		
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		1		
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Relinguished by Company HAHN & ASS		2/01 132	Received by	Company NAA.
Rotinguished by Company	Data	2/01 132	Recraved by	Company
NEA	110-2-	~a: 1 15	ふくししょ なしょう	~ A /', #4

5.77



Hahn and Associates, Inc. 434 NW Sixth Ave., Suite 203 Portland, OR 97209

Seattle 11720 North Creek Pkwy N, Suite 400, Bothell, WA 98011-8244 425.420.9200 fax 425.420.9210 East 11115 Montgomery, Suite B, Spokane, WA 99206-4776 509.924 9200 fax 509.924.9290 9405 SW Nimbus Avenue, Beaverton, DR 97008-7132 503.906.9200 fax 503.906.9210 East 503.906.9210 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588 Project Number: 5106-010928 Project Manager: Guy Tanz

Reported: 10/18/01 11:13

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
5106-010928-102	P1J0098-02	Water	09/28/01 11:24	10/02/01 15:50
5106-010928-103	P1J0098-03	Water	09/28/01 13:12	10/02/01 15:50
5106-010928-104	P1J0098-04	Water	09/28/01 14:25	10/02/01 15:50
5106-010928-105	P1J0098-05	Water	09/28/01 15:30	10/02/01 15:50

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Seattle 11720 North Creek Pkwy N, Suite 400, Bothell, WA 98011-8244 425.420.9200 fgx 425.420.9210 East 11115 Montgomery, Suite 8, Spokane, WA 99206-4776 509.924.9200 fax 509.924.9290 Portland 9405 SW Nimbus Avenue, Beaverton, GR 97008-7132 503.906.9200 fax 503.906.9210 Fax 103.906.9210 Fax 103.

Portland

20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541,383,9310 fax 541,382,7588

Hahn and Associates, Inc.

434 NW Sixth Ave., Suite 203

Portland, OR 97209

Project: T1 South

Project Number: 5106-010928 Project Manager: Guy Tanz

Reported: 10/18/01 11:13

Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-010928-104 (P1J0098-04) Water					Sampled: 09/2	8/01 Rece	ive <u>d:</u> 10/02/	01	
Diesel Range Organics	ND	0.250	mg/l	1	NWTPH-Dx	10/03/01	10/04/01	1100139	·
Heavy Oil Range Hydrocarbons	ND	0.500	11	n	#	4	_ •	•	
Surr: 1-Chlorooctadecane	101 %	50-150					<u> </u>		

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Seattle: 11720 North Creek Plwy N, Suite 400, Botholl, WA 98011-8244 425.420.9200 fex 425.420.9210

425.420.9200 1ax 425.426.9210
East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
509.924.9200 1ax 509.924.9290
9405 SW Nimbus Avenue, Beaverton, OR 97008-7132
503.906.9200 1ax 503.906.9210

20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382,7588

Hahn and Associates, Inc.

434 NW Sixth Ave., Suite 203

Project Number: 5106-010928

Reported:

Portland, OR 97209

Project Manager: Guy Tanz

10/18/01 11:13

Total Metals per EPA 6000/7000 Series Methods

Project: T1 South

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes	
5106-010928-102 (P1J0098-02) Water				5	Sampled: 09/2	8/01 Recei	ived: 10/02/	01		
Arsenic	0.0121	0.00100	mg/l	1	EPA 6020	10/10/01	10/11/01	1100451		
Copper	0.00295	0.00200	•	**	n	11	11	u ·		
Lead	0.00146	0.00100	H	p	н	11	17	Þ		
5106-010928-103 (P1J0098-03) Water					Sampled: 09/2	8/01 Recei	ived: 10/02/	01		
Arsenic	0.0140	0.00100	mg/l	ı	EPA 6020	10/10/01	10/11/01	1100451		
Copper	0.0402	0.00200	-	n	**	n	*			
Lead	0.0362	0.00100	*	**	**	•	11	•		
5106-010928-104 (P1J0098-04) Water					Sampled: 09/2	8/01 Rece	ived: 10/02/	01		
Arsenic	0.00645	0.00100	mg/l	1	EPA 6020	10/10/01	10/11/01	1100451		
Cadmium	ND	0.00100	11	n		**	•	11		
Chromium	0.00512	0.00100		n	**	••	•	п		
Copper	0.00448	0.00200	-	n	u	11	11	•		
- Lead	0.00249	0.00100	10		•	H	10	11		
Mercury	ND	0.000200	**	n	EPA 7470A	10/11/01	10/12/01	1100490		
Nickel	0.00386	0.00200		. 11	EPA 6020	10/10/01	10/11/01	1100451		
Silver	ND	0.00100	"	n	-	11	**	"		
Zinc	0.00906	0.00500	•	**	H	9	4	н		
5106-010928-105 (P1J0098-05) Water	Sampled: 09/28/01 Received: 10/02/01									
Arsenic	0.00272	0.00100	mg/l	1	EPA 6020	10/10/01	10/11/01	1100451		
Copper	0.00251	0.00200	n	u	u	п	r	v		
Lead	ND	0.00100	n	u		•	•	H		
Zinc	0.0116	0.00500	•	u	•	•	в			

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425.420.9200 fax 425.420.9210

Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
509.924.9200 fax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverton, DR 97008-7132 503.906.9200 fax 503.906.9210

Bend 20332 Empira Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588

Hahn and Associates, Inc. 434 NW Sixth Ave., Suite 203

Portland, OR 97209

Project: T1 South

Project Number: 5106-010928 Project Manager: Guy Tanz

Reported: 10/18/01 11:13

Dissolved Metals per EPA 6000/7000 Series Methods

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-010928-102 (P1J0098-02) Water					Sampled: 09/28/	01 Rece	ived: 10/02/	01	
Arsenic	0.0113	0.00100	mg/l	1	EPA 6020	10/12/01	10/16/01	1100551	
Copper	ND	0.00200	-	n		31	10/16/01	17	
Lead	ND	0.00100	•		11	Ħ	•	•	
5106-010928-103 (P1J0098-03) Water				1	Sampled: 09/28/	01 Rece	ived: 10/02/	01	
Arsenic	0.0110	0.00100	mg/l	1	EPA 6020	10/12/01	10/16/01	1100551	
Copper	ND	0.00200	n	n	lt .	u	10/16/01		
Lead	ND	00100.0		и	m	н	II .	**	
5106-010928-104 (P1J0098-04) Water				;	Sampled: 09/28	'01 Rece	ived: 10/02/	01	
Arsenic	0.00651	0.00100	mg/l	ı	EPA 6020	10/12/01	10/16/01	1100551	
Copper	ND	0.00200	"	•	u	-	10/16/01	41	
Lead	ND	0.00100		"	v	11	н	Ħ	
5106-010928-105 (P1J0098-05) Water					Sampled: 09/28	01 Rece	ived: 10/02/	01	
Arsenic	0.00365	0.00100	mg/l	1	EPA 6020	10/12/01	10/16/01	1100551	
Copper	ND	0.00200	7	•	11	**	10/16/01	-	
Lead	ND	0.00100	•		n	77	41	**	

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 Seattle
 11720 North Creek Pkwy N. Suite 400, Bothell, WA 98011-8244

 425,420,9200
 fax 425,420,9210

 Spokane
 East 11115 Montgomery, Suite B, Spokane, WA 99206-4776

 509,924,9200
 fax 509,924,9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.905.9200 tax 503.906.9210

20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541,383,9310 fax 541,382,7588

Hahn and Associates, Inc. 434 NW Sixth Ave., Suite 203 Portland, OR 97209

Project: T1 South

Project Number: 5106-010928 Project Manager: Guy Tanz

Reported: 10/18/01 11:13

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-010928-104 (P1J0098-04) Water					Sampled: 09/2	8/01 Recei	ved: 10/02/0)1	
Acetone	ND	25.0	ug/l	1	EPA 8260B	10/04/01	10/04/01	1100190	_
Benzene	ND	1.00	41	**	•	•	•	•	
Bromobenzene	ND	1.00	**	Ħ	10	•	•	•	
Bromochloromethane	ND	1.00	**	n	11	n		٠.	
Bromodichloromethane	ND	1.00	**	tt.	u u	**	u	H	•
Bromoform	ND	1.00	**	п	•	11	n		
Bromomethane	ND	5.00	11	H	"	11	••	*	
2-Butanone	ND	10.0	**	H		11	m	"	
n-Butylbenzene	ND	5.00	11	n	•	•	4	r	
sec-Butylbenzene	ND	1.00	n	u	11		11		
tert-Butylbenzene	ND	1.00		н	н		71		
Carbon disulfide	ND	10.0	H.	н	** .	•	"	n	
Carbon tetrachloride	ND	1.00	"	h	•	•	n	n	
Chlorobenzene	ND	1.00	,,	D		H		II .	
Chloroethane	ND	1.00	7	n	IP.)1	tı	lr .	
Chloroform	ND	1.00		n	•	n	•	II .	
Chloromethane	ND	5.00	•		-	n	r	•	
2-Chlorotoluene	ND	1.00	•	•	•	11	-	•	
4-Chlorotoluene	ND	1.00	n	=	₩	h	•	•	
1,2-Dibromo-3-chloropropane	ND	5.00	u	#	*		-	•	
Dibromochloromethane	ND	1.00	*1	Ħ	11		•	71	
1,2-Dibromoethane	ND	1.00	ŧı	11		-	n	TI	
Dibromomethane	ND	1.00	"	π	17	•	**	•	
1,2-Dichlorobenzene	ND	1.00		n	n	*		н	
1,3-Dichlorobenzene	ND	1.00		"	19	H	v	11	
1,4-Dichlorobenzene	ND	1.00	н	*	n	n		п	
Dichlorodifluoromethane	ND	5.00	,	**		ŧi	"	•	
1,1-Dichloroethane	ND	1.00		n	n	#	**	*	
1,2-Dichloroethane	ND	1.00			D	п	n		
1,1-Dichloroethene	ND	1.00	n	v	n	n		. н	
cis-1,2-Dichloroethene	ND	1.00	n	**		"		n	
trans-1,2-Dichloroethene	ND	1.00	•	•	n n	•	"		
1,2-Dichloropropane	ND	1.00	4	u		•	н		
1,3-Dichloropropane	ND	1.00	•	n	n	•	11	H	
2,2-Dichloropropane	ND	1.00	•	n	-		**	H*	
1,1-Dichloropropene	ND	1.00	•	"	-	и	"		
cis-1,3-Dichloropropene	ND	1.00	•	•	-	0	ır		•
trans-1,3-Dichloropropene	ND	1.00	•		n	u	"		
Ethylbenzene	ND	1.00		•	Ħ	n	•	•	

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425.420.9200 fax 425.420.9210 Spokane East 11115 Montgomery, Suite B, Spokane, WA 99205-4776 509.924.9200 fax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503-906.9200 fax 503.906.9210

20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588

Hahn and Associates, Inc.

434 NW Sixth Ave., Suite 203 Portland, OR 97209

Project: T1 South

Project Number: 5106-010928 Project Manager: Guy Tanz

Reported: 10/18/01 11:13

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-010928-104 (P1J0098-04) Water					Sampled: 09/2	8/01 Rece	ived: 10/02/	01	
Hexachlorobutadiene	ND	2.00	ug/l	1	EPA 8260B	10/04/01	10/04/01	1100190	
2-Hexanone	ND	10.0	. 11	•		n	n	•	
Isopropylbenzene	ND	2.00		u	n	•	11	11	
p-Isopropyltoluene	ND	2.00	•	**	7	•	**	TI	
4-Methyl-2-pentanone	ND	5.00	n	n	•	11	p	H	
Methyl tert-butyl ether	. ND	1.00	*11	n	-	u	n	11	
Methylene chloride	ND	5.00	Þ	11	•	•	•	n	
Naphthalene	ND	2.00		D			*	н	
n-Propylbenzene	ND	1.00	11	•	и	Ħ	**	•	
Styrene	ND	1.00		•	н	h	tı .	•	•
1,1,1,2-Tetrachloroethane	ND	1.00	11	**	11		**	1)	
1,1,2,2-Tetrachloroethane	ND	1.00	-	P.	n	•	"	п	
Tetrachloroethene	ND	1.00	•	**	n	•			
Toluene	ND	1.00		h	•	n	n		
1,2,3-Trichlorobenzene	ND	1.00	*	•	•	**	•	*	
1,2,4-Trichlorobenzene	ND	1.00	n	"	**	"	•	n	
1,1,1-Trichloroethane	ND	1.00			**		•	-	
1,1,2-Trichloroethane	ND	1.00	n	•	н		**	•	
Trichloroethene	ND	1.00		**	n	ii .	11	**	
Trichlorofluoromethane	ND	1.00	to to	41	11		**	7	
1,2,3-Trichloropropane	ND	1.00	a	"	н	•		n	
1,2,4-Trimethylbenzene	ND	1.00	•	"	-	*	11	**	
1,3,5-Trimethylbenzene	ND	1.00	-	"	•	•	ч	,,	
Vinyl chloride	ND	1.00	**	**	•	**	4	n	
o-Xylene	ND	1.00		**	n	**	-	n	
m,p-Xylene	ND	2.00	n	*	н	**	-	n	
Surr: 4-BFB	110%	75-125							
Surr: 1,2-DCA-d4	110%	75-125							
Surr: Dibromofluoromethane	111%	75-125							
Surr: Toluene-d8	104 %	75-125							

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425.420.9200 fax 425.420.9210 East 11115 Montgomery, Suite 8, Spokane, WA 99206-4776 509.924.9200 fax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132

503.966.9200 fax 503.906.9210

Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701.5711
541.383.9310 fax 541.382.7588

Hahn and Associates, Inc.

434 NW Sixth Avc., Suite 203

Project: T1 South

Project Number: 5106-010928

Reported:

Portland, OR 97209

Project Manager: Guy Tanz

10/18/01 11:13

Semivolatile Organic Compounds per EPA Method 8270C

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Note
5106-010928-105 (P1J0098-05) Water				5	Sampled: 09/2	8/01 Rece	ived: 10/02/	01	
Bis(2-ethylhexyl)phthalate	ND	10.0	ug/l	1	EPA 8270C	10/04/01	10/10/01	1100188	
Surr: 2-Fluorobiphenyl	56.6 %	26-135							
Surr: Nitrobenzene-d5	84.3 %	23-147							
Surr: p-Terphenyl-d14	111%	38-149							

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541.383.9310 (ax 541.382.7588

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Project: T1 South Project Number: 5106-010928 Project Manager: Guy Tanz

Reported: -10/18/01 11:13

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-010928-102 (P1J0098-02) Water				2	Sampled: 09/2	8/01 Recei	ived: 10/02/)1	
Acenaphthene	0.448	0.100	ug/l	i	EPA 8270m	10/04/01	10/08/01	1100208	
Acenaphthylene	ND	0.100	-	•		#	-	-	
Anthracene	ND	0.100	*		•	n	•		
Benzo (a) anthracene	ND	0.100	•	n	7	•	n	н	
Benzo (a) pyrene	ND	0.100	41	*	•		*	**	
Benzo (b) fluoranthene	ND	0.100		#	*	41		**	
Benzo (ghi) perylene	ND	0.100	**	tr	**	π	11	. "	
Benzo (k) fluoranthene	ND	0.100	п	"	**	\$1		D	
Chrysene	ND	0.100	=	n	•	п	**	м	
Dibenzo (a,h) anthracene	ND	0.200	٠			11	**	н	
Fluoranthene	ND	0.100	*	11	•	•	**	n	
Fluorene	ND	0.100		17	14		**	n	
Indeno (1,2,3-cd) pyrene	ND	0.100		11	н	*		11	
Naphthalene	ND	0.100	.,	11	**	•	n		
Phenanthrene	1.16	0.100	н	32		n	D	**	
Pyrene	0.172	0.100	*	4	u	11	**	"	
Surr: Fluorene-d10	66.1 %	25-105							
Surr: Pyrene-d10	87.3 %	30-130							
Surr: Benzo (a) pyrene-d12	55.9 %	22-120							
5106-010928-103 (P1J0098-03) Water					Sampled: 09/2	8/01 Rece	ived: 10/02/	01	
Acenaphthene	0.192	0.100	ug/l	1	EPA 8270m	10/04/01	10/10/01	1100208	
Acenaphthylene	ND	0.100		u	n	•		n	
Anthracene	ΝD	0.100	11	13	4	n	7	n	
Benzo (a) anthracene	ND	0.100		n	11	**	•	,,	
Benzo (a) pyrene	ND	0.100	"	n	D	•	•	n	
Benzo (b) fluoranthene	ND	0.100		M	Ħ	n	11	*	
Benzo (ghi) perylene	ND	0.100	4	11	**	"	"	- "	
Benzo (k) fluoranthene	ND	0.100	11	v	••	10	**	"	
Chrysene	ND	0.100	11	n	91	10	•	11	
Dibenzo (a,h) anthracene	ND	0.200		n	**	**	"	11	
Fluoranthene	ND	0.100	n	n	#	11	"	u	
Fluorene	МD	0.100	79	•	n	n	n	n	
Indeno (1,2,3-cd) pyrene	ND	0.100	*	•	11	0	n	•	
Naphthalene	ND	0.100	•	•	••	"	"	•	
Phenanthrene	0.138	0.100	•	•	₩	tr	11	-	
Pyrene	ND	0.100		+	<u>.</u>	н		•	
Surr: Fluorene-d10	70.8 %	25-105							

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425.420.9200 fax 425.420.9210 Spokane East 11115 Montgomery, Suite B. Spokane, WA 99208-4776 509.924.9200 fax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beavenon, Oil 97008-7132

503.906.9200 fax 503.906.9210

Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711
541.383.9310 fax 541.382.7588

Hahn and Associates, Inc.

434 NW Sixth Ave., Suite 203 Portland, OR 97209

Project: Ti South

Project Number: 5106-010928 Project Manager: Guy Tanz

Reported:

10/18/01 11:13

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Surr: Pyrene-d10 89,8 % d6.2 % 22-120 30-130 % 22-120 Store: Benzo (a) pyrene-d12 46.2 % 22-120 Sampled: 09/28/01 Received: 10/02/01 5106-010928-104 (P1J0098-04) Water Sampled: 09/28/01 Received: 10/02/01 Accnaphthene ND 0.100 " " " " " " " " " " " " " " " " " " "	1		Reporting							
Surr: Pyrene-d10	Analyte	Result	Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
Sampled: 09/28/01 Received: 10/02/01 Accnaphthene 0.720 0.100 ug/l EPA 8270m 10/04/01 10/16/01 10/02/08 Accnaphthylene ND 0.100 - - - - - - - - -	5106-010928-103 (P1J0098-03) Water					Sampled: 09/2	8/01 Rece	ived: 10/02/	01	
Sampled: 09/28/01 Reciver 10/02/01 10/02/02 Acenaphthene 0,720 0,100 ug/l 1 EPA 8270m 10/04/01 10/10/01 10/02/08 Acenaphthylene ND 0,100 - - - - - - - - -	Surr: Pyrene-d10	89.8 %	30-130							
Acenaphthene ND 0.100 ug/l r PA 82701 10/10/01 10/10/01 1100208 Acenaphthylene ND 0.100	Surr: Benzo (a) pyrene-d12	46.2 %	22-120							
Acenaphthylene ND 0.100 - " " " " " " " " " Anthracene ND 0.100 - " " " " " " " " " " " " " " " " " "	5106-010928-104 (P1J0098-04) Water					Sampled: 09/2	8/01 Rece	ived: 10/02/	01	
Anthracene ND 0.100 - " " " " " " " " " " " " " " " " " "	Acenaphthene	0.720	0.100	ug/l	t	EPA 8270m	10/04/01	10/10/01	1100208	
Benzo (a) anthracene ND 0.100 " " " " " " " " Benzo (a) pyrene ND 0.100 " " " " " " " " "	Acenaphthylene	ND	0.100	-	-	•	17	11	••	
Benzo (a) pryrene ND 0.100 " " " " " " " " " " " " " Benzo (b) fluoranthene ND 0.100 " " " " " " " " " " " " " " " " " "	Anthracene	ND	0.100		-	11	•	n	***	
Benzo (b) fluoranthene ND 0.100 " " " " " " " " "	Benzo (a) anthracene	ND	0.100	•	41	11	н	11	11	
Benzo (ghi) perylene ND 0.100 " " " " " " " " "	Benzo (a) pyrene	ND	0.100	•	*	11		n	11	
Benzo (ghi) perylene ND 0.100 * " </td <td></td> <td>ND</td> <td>0.100</td> <td>-</td> <td>n</td> <td>11</td> <td>N</td> <td></td> <td>n</td> <td></td>		ND	0.100	-	n	11	N		n	
Benzo (k) fluoranthene		ND	0.100	**	11	n		•	11	
Chrysene				"	**	11	n	-	11	
Dibenzo (a,h) anthracene ND 0.200 " " " " " " " " " " " " " " "	• •	ND		17	ij	16	*	-	0	
Fluorenthene ND 0.100 "		ND		**	11	н	11	-		
Fluorene ND 0.100 "	• • •			"	"	•	11	•		
Indeno (1,2,3-cd) pyrene ND	Fluorene					44		-		
Naphthalene					13	n	v	#	17	
Phenanthrene 9.576 0.100 " " " " " " " " "				*	n	n	*	•		
Pyrene 0.123 0.100 " " " " " " " " "			· ·	н	•	o o	•	n	-	
Surr: Pyrene-d10 115 % 30-130 Surr: Benzo (a) pyrene-d12 75.0 % 22-120 \$106-010928-105 (P1J0098-05) Water Sampled: 09/28/01 Received: 10/02/01 Acenaphthene ND 0.100 ug/l 1 EPA 8270m 10/04/01 10/10/01 1100208 Acenaphthylene ND 0.100 " " " " " " " " " " " " " " " " " "					4	n		11	•	
Sampled: 09/28/01 Received: 10/02/01 Acenaphthene	Surr: Fluorene-d10	90.7 %	25-105							
Sampled: 09/28/01 Received: 10/02/01 Acenaphthene	Surr: Pyrene-d10	115%	30-130							
Acenaphthene ND 0.100 ug/l 1 EPA 8270m 10/04/01 10/10/01 1100208 Acenaphthylene ND 0.100 "	•	75.0 %	22-120							
Acenaphthene ND 0.100 ug/l 1 EPA 8270m 10/04/01 10/10/01 1100208 Acenaphthylene ND 0.100 "	\$106-010928-105 (P1J0098-05) Water					Sampled: 09/2	8/01 Rece	ived: 10/02/	/O1	
Acenaphthylene ND 0.100 "	Acenaphthene	ND	0.100	ug/I	1	EPA 8270m	10/04/01	10/10/01	1100208	
Anthracene ND 0.100 "	•	ND	0.100	-	-	•	ч	n	M	
Benzo (a) anthracene ND 0.100 " <td></td> <td>ND</td> <td></td> <td>n</td> <td>•</td> <td>77</td> <td>ų</td> <td>¥</td> <td></td> <td></td>		ND		n	•	77	ų	¥		
Benzo (a) pyrene ND 0.100 "	Benzo (a) anthracene			*	w	Ħ	"	**	**	
Benzo (b) fluoranthene ND 0.100 "<				-	•	н	"		n	
Benzo (ghi) perylene ND 0.100 " <td></td> <td></td> <td></td> <td>-</td> <td>٠</td> <td>h</td> <td>n</td> <td>11</td> <td></td> <td></td>				-	٠	h	n	11		
Benzo (k) fluoranthene ND 0.100 "<				•	**	ч			**	
Chrysene ND 0.100 " <				•		tr	n	***		
Dibenzo (a,h) anthracene ND 0.200 " " " " " " " " " " " " " " " " " " "	* *				-		ıı	n		
Fluoranthene ND 0.100 " " " " " " " " Fluorene ND 0.100 " " " " " " " " " " " " " " " " " "	•			-	n	**	11	11	**	
Fluorene ND 0.100 " " " " "				п		be .	n	.,	n	
				**		н		-	þi	
	Indeno (1,2,3-cd) pyrene	ND ND	0.100	11	•	h	**	-		

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Lisa Domenighini, Project Manager

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425.420.9200 fax 425.420.9210
East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
509.924.9200 fax 509.924.9290 Spokane

503.324.3200 18X 503.324.3229 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906.9200 1ax 503.906.9210 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 1ax 541.382.7588

Hahn and Associates, Inc.

434 NW Sixth Ave., Suite 203 Portland, OR 97209

Project: TI South

Project Number: 5106-010928

Reported:

Project Manager: Guy Tanz

10/18/01 11:13

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-010928-105 (P1J0098-05) Water					Sampled: 09/2	8/01 Rece	ived: 10/02/	01	
: · Naphthalene	ND	0.100	ug/l	1	EPA 8270m	10/04/01	10/10/01	1100208	
Phenanthrene	ND	0.100	ET.	ır	н	•	11	#	
Pyrene	ND	0.100	π.	•	11	11	n	n	
Surr: Fluorene-d10	81.4%	25-105							
Surr: Pyrene-d10	107 %	30-130							
Surr: Benzo (a) pyrene-d12	63.1 %	22-120							

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 Seattle
 11720 North Creek Pkvy N, Suite 400, Bothell, WA 98011-8244 425,420,9200

 Spokane
 East 11115 Montgomery, Suite B, Spokane, WA 99206-4776 509,924,9200

 Portland
 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503,906,9200

 Bend
 2032 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541,383,9310

 Instance of the control of the

Hahn and Associates, Inc. 434 NW Sixth Ave., Suite 203 Portland, OR 97209

Project: T1 South Project Number: 5106-010928 Project Manager: Guy Tanz

Reported: 10/18/01 11:13

Conventional Chemistry Parameters per APHA/EPA Methods North Creek Analytical - Portland

Analyte	Result	Reporting . Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-010928-102 (P1J0098-02) Water					Sampled: 09/2	8/01 Rece	ived: 10/02/	01	
Total Suspended Solids	108	25.0	mg/l	1	EPA 160.2	10/05/01	10/09/01	1100243	
5106-010928-103 (P1J0098-03) Water				,	Sampled; 09/2	8/01 Rece	ived: 10/02/	01	
Total Suspended Solids	720	50.0	mg/l	1	EPA 160.2	10/05/01	10/09/01	1100243	
5106-010928-104 (P1J0098-04) Water					Sampled: 09/2	8/01 Rece	ived: 10/02/	01	
Total Suspended Solids	130	20.0	mg/l	1	EPA 160.2	10/05/01	10/09/01	1100243	
5106-010928-105 (P1J0098-05) Water					Sampled: 09/2	8/01 Rece	ived: 10/02/	01	
Total Suspended Solids	50.0	20.0	mg/l	1	EPA 160.2	10/05/01	10/09/01	1100243	

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509.924.9200 fax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906 9200 fax 503.906.9210

20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588

Hahn and Associates, Inc.

Heavy Oil Range Hydrocarbons

Surr: 1-Chlorooctadecane

434 NW Sixth Ave., Suite 203

Portland, OR 97209

Project: T1 South

Project Number: 5106-010928

Project Manager: Guy Tanz

Reported:

10/18/01 11:13

Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method - Quality Control

North	Creek A	Analytical	l - Porti	land

1.58

0.0960

107

50-150

50-150

2.40

50

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1100139 - EPA 3510 Fuels										
Blank (1100139-BLK1)				Prepare	d & Analy	zed: 10/02	3/01			
Diesel Range Organics	ND	0.250	mg/l							
Heavy Oil Range Hydrocarbons	ND	0.500	11							
Surr: I-Chlorooctadecane	0.0851		"	0.0960		88.6	50-150			
LCS (1100139-BS1)				Ртераге	d & Analy	zed: 10/03	3/01			
Diesel Range Organics	2.51	0.250	mg/l	2.58		97.3	50-150			
^j Heavy Oil Range Hydrocarbons	1.65	0.500		1.58		104	50-150			
Surr: I-Chlorooctadecane	0.0923		n	0.0960		96.1	50-150			
LCS Dup (1100139-BSD1)				Ргераге	d & Analy	zed: 10/0	3/01			
Diesel Range Organics	2.49	0.250	mg/l	2.58		96.5	50-150	0.800	50	

1.69

0.0911

0.500

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Hahn and Associates, Inc.

434 NW Sixth Ave., Suite 203 Portland, OR 97209

Project: T1 South

Project Number: 5106-010928 Project Manager: Guy Tanz

Reported:

10/18/01 11:13

Total Metals per EPA 6000/7000 Series Methods - Quality Control

North	Creek.	Analy	tical -	Portland	

- [
: i	ì						_					
1				Reporting		Spike	Source		%REC		RPD	
- 1	i			recponding		Opinc	Some		/UKEC		IG D	
	l			• • •			n 1.	4/220		222		
,	Analyte		Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
	·											

Blank (1100451-BLK1)	<u> </u>			Prepared: 10/	10/01 Analyz	ed: 10/11/01	l		
Arsenic	ND	0.00100	mg/l						
Cadmium	ND	0.00100	t#						
Chromium	ND	0.00100	*						
Copper	ND	0.00200	и						
Lead	ND	0.00100	n						
Nickel	ND	0.00200							
Silver	ND	0.00100	•						
Zinc.	ND	0.00500						•	
LCS (1100451-BS1)			Prepared: 10/	10/01 Analyz	ed: 10/11/0	<u>i</u>			
Arsenic	0.104	0.00100	mg/l	0.100	104	80-120			
Cadmium	0.104	0.00100	n	0.100	104	80-120			
Chromium	0.103	0.00100	41	0.100	103	80-120			
Copper	0.103	0.00200	rt	0.100	103	80-120			
Lead	0.104	0.00100	-	0.100	104	80-120			
Nickel	0.102	0.00200	. •	0.100	102	80-120			
Silver	0.0497	0.00100	ti	0.0500	99.4	80-120			
Zinc	0.106	0.00500	"	0.100	106	80-120			
Duplicate (1100451-DUP1)	Sou	Source: P1J0097-03		Prepared: 10/	10/01 Analyz	ed: 10/11/0	1		
Arsenic	0.00222	0.00100	mg/l	0.00	201		9.93	20	
Cadmium	ND	0.00100	11	N)			20	
Chromium	0.00294	0.00100	*	0.00	325		0.01	20	
Copper	0.00415	0.00200	n	0.00	474		13.3	20	
Lead	0.00102	0.00100	n	0.00	116		12.8	20	
Nickel	0.00502	0.00200	"	0.00	525		4.48	20	
Silver	ND	0.00100		N	D			20	
Zinc	0.00914	0.00500	н	0.01	06		14.8	20	

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Lisa Domenighini, Project Manager

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425.420.9200 fax 425.420.9210

 Spokane
 East 11115 Montgomery, Suite B, Spokane, WA 99206-4776 509.924.9200

 Fontland
 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132

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503.906.9200 fax 503.906.9210

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%REC

Limits

RPD

Hahn and Associates, Inc.

Analyte

434 NW Sixth Ave., Suite 203 Portland, OR 97209

Project: T1 South

Project Number: 5106-010928 Project Manager: Guy Tanz

Reported:

10/18/01 11:13

RPD

Limit

Notes

Total Metals per EPA 6000/7000 Series Methods - Quality Control

North	Creek	Analyt	ical -	Port	land
110111	CICCK	AND SHARK E.	ICAL -	A UA U	ıanı

Units

Spike

Level

Source

Result

Batch 1100451 - EPA 200/3005	 -		<u> </u>					
Matrix Spike (1100451-MS1)	Sou	arce: P1J009	7-03	Prepare	d: 10/10/0	l Analyz	zed: 10/11/01	
Arsenic	0.0929	0.00870	mg/l .	0.100	ND	90.9	75-125	
} Cadmium	0.0931	0.00870	n	0.100	ND	93.0	75-125	
Chromium · ·	0.112	0.00100	*1	0.100	0.00325	109	75-125	
Copper	0.111	0.00200	71	0.100	0.00474	106	75-125	
Lead .	0.109	0.00100		0.100	0.00116	108	75-125	
Nickel	0.109	0.00200	**	0.100	0.00525	104	75-125	
Silver	0.0519	0.00100	**	0.0500	ND	103	75-125	
Zine ·	0.116	0.00500	n	0.100	0.0106	105	75-125	
Matrix Spike (1100451-MS2)	Sou	ırce: P1J009	7-04	Prepare	ed: 10/10/0	1 Analy:	zed: 10/11/01	
Arsenic	0.104	0.00100	mg/l	0.100	0.00106	103	. 75-125	
Codmium	0.102	0.00100		0.100	MD	102	75 125	

Arsenic	0.104	0.00100	mg/l	0.100	0.00106	103	. 75-125	
Cadmium	0.102	0.00100	•	0.100	ND	102	75-125	
Chromium	0.102	0.00100	•	0.100	0.00265	99.4	75-125	
Copper	0.101	0.00200	n	0.100	0.00388	97.1	75-125	
Lead	0.0995	0.00100	"	0.100	ND	98.5	75-125	
Nickel	. 0.101	0.00200	tr	0.100	0.00449	96.5	75-125	
Silver	0.0480	0.00100	n	0.0500	ND	95.6	75-125	
Zinc	0.106	0.00500	n	0.100	0.00843	97.6	75-125	

Reporting

Limit

Result

Batch 1100490 - EPA 7470

Blank (1100490-BLK1)				Prepared: 10/11/01	Analyzed: 10/12/01
Mercury	ND	0.000200	mg/l		

, · · · · · · · · · · · · · · ·		0.000200					
LCS (1100490-BS1)				Prepared: 10)/11/01 Analyz	ed: 10/12/01	
Mercury	0.00486	0.000200	me/l	0.00500	97.2	80-120	

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503.905.9200 fax 503.905.9210

Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711
541.383.9310 fax 541.382.7588

Hahn and Associates, Inc.

434 NW Sixth Ave., Suite 203 Portland, OR 97209

Project: T1 South

Project Number: 5106-010928

Reported:

Project Manager: Guy Tanz

10/18/01 11:13

Total Metals per EPA 6000/7000 Series Methods - Quality Control

North	Creek	Analytical	- Portland

·		Reporting		Spike	Source		%REC		RPD	
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Duplicate (1100490-DUP1)		Sou	rce: P1J009	8-04	Prepared	: 10/11/0	l Analyz	ed: 10/12/01	
Мегсигу	N	1D	0.000200	mg/l	·	ND			20
Matrix Spike (1100490-MS1)		Sou	rce: P1J009	8-04	Prepared	: 10/11/0	l Analyz	ed: 10/12/01	
Mercury	0.004	87	0.000200	mg/i	0.00500	ND	97.4	75-125	

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Hahn and Associates, Inc.

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Project: T1 South Project Number: 5106-010928

Project Manager: Guy Tanz

Reported:

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Dissolved Metals per EPA 6000/7000 Series Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1100551 - EPA 200/3005 Diss								,		
Blank (1100551-BLK1)				Prepared	t: 10/12/0	l Analyz	ed: 10/16/0	11		
Arsenic	ND	0.00819	mg/l							
Copper	ND	0.00200	tr							
Lead	ND	0.00100	w							
LCS (1100551-BS1)				Prepared	1: 10/12/0	l Analyz	ed: 10/16/0)[
Arsenic	0.102	0.00100	mg/l	0.100		102	80-120			
Copper	0.102	0.00200	11	0.100		102	80-120			
Lead	0.101	0.00100	#	0.100		101	80-120			
Duplicate (1100551-DUP1)	Sou	urce: P1J009	7-01	Ргерагес	1: 10/12/0	l Analyz	æd: 10/16/0)1		Q-06
Arsenic	ND	0.00100	mg/l		ND			92.1	20	
Copper	ND	0.00200	•		ND			40.0	20	Q-06
Lead	ND	0.00100	"		ND			137	20	Q-06
Matrix Spike (1100551-MS1)	Sou	urce: P1J009	7-01	Preparea	t: 10/12/0	1 Analyz	ed: 10/16/0)1		

Copper	0.0995	0.00200	m	0.100	ND	98.8	75-125	
Lead	0.0978	0.00100	•	0.100	ND	97.6	75-125	
Matrix Spike (1100551-MS2)	Sou	rce: P1J019	2-01	Prepare	d: 10/12/0	l Analyz	ed: 10/16/01	
Arsenic	0.102	0.00100	mg/l	0.100	ND	102	75-125	~
Соррег	0.100	0.00200	11	0.100	ND	99.3	75-125	•
Lead	0.0957	0.00100	-	0.100	ND	95.6	75-125	

0.100

ND

0.00100

0.102

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75-125

102



Arsenic



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9405 SW Nimbus Avenue, Beaverton, OR 97008-7132

503,906,9200 fax 503,906,9210 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541,383,9310 fax 541,382,7588

Hahn and Associates, Inc.

Project: T1 South

Reported:

434 NW Sixth Ave., Suite 203 Portland, OR 97209

Project Number: 5106-010928 Project Manager: Guy Tanz

10/18/01 11:13

Volatile Organic Compounds per EPA Method 8260B - Quality Control

North	Creek	Anal	vtical	- Portland

										ı
	Reporting		Spike	Source		%REC		RPD		
Analyte Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes	

Patch	1100190	EDA	5030B
Baich	111111111111	- r.r.a	701 701174

Batch 1100190 - EPA 5030B				D 10 1 1 10/04/01
Blank (1100190-BLK1)				Prepared & Analyzed: 10/04/01
Acetone	ND	25.0	ug/l	
Benzene	ND	1.00	*	
Bromobenzene	ND	1.00		
Bromochloromethane	ND	1.00	•	
Bromodichloromethane	ND	1.00		
Bromoform	ND	1.00	*	
Bromomethane	ND	5.00	п	
2-Butanone	ND	10.0	"	
n-Butylbenzene	ND	5.00	11	
sec-Butylbenzene	ND	1.00	-	
tert-Butylbenzene	ND	1.00	П	
Carbon disulfide	ND	10.0	"	
Carbon tetrachloride	ND	1.00	**	
Chlorobenzene	ND	1.00	17	
Chloroethane	ND	1.00	•	
Chloroform	ND	1.00	n	
Chloromethane	ND	5.00	•	
2-Chlorotoluene	ND	1.00	н	
4-Chlorotoluene	ND	1.00	"	
1,2-Dibromo-3-chloropropane	ND	5.00	11	
Dibromochloromethane	ND	1.00	17	
1,2-Dibromoethane	ND	1.00	*	
Dibromomethane	ND	1.00	**	
1.2-Dichlorobenzene	ND	1.00	-	
1,3-Dichlorobenzene	ND	1.00	11	
1,4-Dichlorobenzene	ND	1.00	"	
Dichlorodifluoromethane	ND	5.00	Ħ	
1,1-Dichloroethane	ND	1.00	•	
1,2-Dichloroethane	ND	1.00	**	
1,1-Dichloroethene	ND	1.00	-	
cis-1,2-Dichloroethene	ND	1.00	**	
trans-1,2-Dichloroethene	ND	1.00	17	
1,2-Dichloropropane	ND	1.00	₩	
1,3-Dichloropropane	ND	1.00	н	
2,2-Dichloropropane	ND	1.00		
1,1-Dichloropropene	ND	1.00	o	

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Lisa Domenighini, Project Manager

North Creek Analytical, Inc. **Environmental Laboratory Network**



Seattle 11720 North Creek Pkwy N, Suite 400, Bothell, WA 98011-8244 425.420.9200 fax 425.420.9210 East 11115 Montgomery, Suite B, Spokane, WA 99205-4776 509.924.9200 fax 509.924.9290 Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.905.9210 ax 503.905.9210 Paral 0232 Emilia Avenue, State E, 1 Bood, OR 0.720, 5711

Spokane

Portland

20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711

541.383.9310 fax 541.382.7588

Hahn and Associates, Inc.

434 NW Sixth Ave., Suite 203

Project: T1 South

Project Number: 5106-010928

Reported:

Portland, OR 97209 Project Manager: Guy Tanz 10/18/01 11:13

Volatile Organic Compounds per EPA Method 8260B - Quality Control

North Creek Analytical - Portland

		Reporting		Spike	Source		%REC		RPD	
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch	1100190	- EPA	5030B

Blank (1100190-BLK1)				Prepared & A	nalyzed: 10/0-	4/01	
cis-1,3-Dichloropropene	ND	1.00	ug/l		-		
trans-1,3-Dichloropropene	ND	1.00	"				
Ethylbenzene	ND	1.00	u				
Hexachlorobutadiene	NĎ	2.00	ri				
2-Hexanone	ND	10.0					
sopropylbenzene	ND	2.00	n				
p-Isopropyltoluene	ND	2.00	H				
1-Methyl-2-pentanone	ND	5.00	۳.				
Methyl tert-butyl ether	ND	1.00	•				
Methylene chloride	ND	5.00					
Naphthaleue	ND	2.00	P				
n-Propylbenzene	ND	1.00	tr				
Styrene	ND	1.00					
,1,1,2-Tetrachloroethane	ND	1.00	er er				
,1,2.2-Tetrachloroethane	ND	1.00	n				
etrachloroethene	ND	1.00	п				
Toluene	ND	1.00	11				
,2,3-Trichlorobenzene	ND	1.00	n				
,2,4-Trichlorobenzene	ND	1.00	н				
,1,1-Trichloroethane	ND	1.00	n				
,1.2-Trichloroethane	ND	1.00	•				
Trichloroethene	ДИ	1.00	n				
[richlorofluoromethane	ďИ	1.00	**				
,2,3-Trichlompropane	ND	1.00	-				
,2,4-Trimethylbenzene	ND	1.00					
,3,5-Trimethylbenzene	ND	1.00	-				
/inyl chloride	ND	1.00	11				
-Xylene	ND	1.00	**				
n,p-Xylene	ND	2.00	н				
Surt: 4-BFB	21.6		,	20.0	108	75-125	
Surr: 1,2-DCA-d4	21.6		*	20.0	108	75-125	
Surr: Dibromofluoromethane	20.2		77	20.0	101	75-125	
Surr: Toluene-d8	20.4		•	20.0	102	75-125	

North Creek Analytical - Portland

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Lisa Domenighini, Project Manager

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425.420.9200 fax 425.420.9210
East 11115 Montgomery, Suite B, Spokane, WA 99205-4776
509.924.9200 fax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132

503.906.9260 fax 503.906.9210 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588 Bend

Hahn and Associates, Inc.

Portland, OR 97209

434 NW Sixth Ave., Suite 203

Project: T1 South

Project Number: 5106-010928 Project Manager: Guy Tanz

Reported:

10/18/01 11:13

Volatile Organic Compounds per EPA Method 8260B - Quality Control

North Creek Analytical - Portland

	1101	th Cicck	7 1		or mana					
Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<u> </u>										
Batch 1100190 - EPA 5030B			 							
LCS (1100190-BS1)				Ргераге	d & Analy	zed: 10/0	4/01			
Benzene .	20.4	1.00	ug/l	20.0		102	80-125			
Chlorobenzene	23.6	1.00		20.0		118	80-125			
1,1-Dichloroethene	19.6	00.1	n	20.0		98.0	70-135			
Toluene	21.8	1.00	"	20.0		109	80-125			
Trichloroethene	19.2	1.00	H	20.0		96.0	70-130			
Surr: 4-BFB	23.0		W	20.0		115	75-125			
Surr: 1,2-DCA-d4	21.6		n	20.0		108	75-125			
Surr: Dibromofluoromethane	19.7		"	20.0	-	98.5	75-125			
Surr: Toluene-d8	20.9		7	20.0		104	75-125			
Matrix Spike (1100190-MS1)	So	Source: P1J0057-04 Prepared				/zed: 10/0	4/01			
Benzene	19.8	1.00	ug/l	20.0	ND	97.7	80-125			
Chlorobenzene	22.3	1.00	"	20.0	ND	112	80-125			
1,1-Dichloroethene	20.0	1.00		20.0	ND	100	70-135			
Toluene	21.3	1.00	15	20.0	ND	106	80-125			
Trichloroethene	18.4	1.00	11	20.0	ND	89.0	70-130	•		
Surr: 4-BFB	22.5		"	20.0		112	75-125			
Surr: 1,2-DCA-d4	20.7		•	20.0		104	75-125			
Surr: Dibromofluoromethane	20.8		* .	20.0		104	75-125			
Surr: Toluene-d8	20.9		"	20.0		104	75-125			
Matrix Spike Dup (1100190-MSD1)	So	urce: P1J005	57-04	Ргераго	ed & Anal	yzed: 10/0	4/01			
Benzene	20.0	1.00	ug/l	20.0	ND	98.7	80-125	1.01	25	
Chlorobenzene	22.1	1.00	*	20.0	ND	110	80-125	0.901	25	
1.1-Dichloroethene	19.6	1.00		20.0	ND	98.0	70-135	2.02	25	
Toluene	21.0	1.00	11	20.0	ND	105	80-125	1.42	25	
Trichloroethene	18.5	1.00	4	20.0	ND	89.4	70-130	0.542	25	
Surr: 4-BFB	22.4		ď	20.0		112	75-125			
Surr: 1,2-DCA-d4	21.0		•	20.0		105	75-125			

20.0

20.0

20.5

20.8

North Creek Analytical - Portland

Surr: Dibromofluoromethane

Surr: Toluene-d8

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75-125

75-125

102

104

Lisa Domenighini, Project Manager

North Creek Analytical, Inc. **Environmental Laboratory Network**



Seattle 11720 North Creek Pkwy N, Suite 400, Bothell, WA 98011-8244 425.420.9200 fax 425.420.9210
Spokane East 11115 Montgomery, Suite B, Spokane, WA 99205-4776 509.924.9200 fax 509.924.9290
Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.905.9200 fax 503.905.9210

Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588

Hahn and Associates, Inc.

434 NW Sixth Ave., Suite 203

Portland, OR 97209

Project: T1 South

Project Number: 5106-010928

Project Manager: Guy Tanz

Reported:

10/18/01 11:13

Semivolatile Organic Compounds per EPA Method 8270C - Quality Control

]	North (Creek .	Analy	ztical -	– Porti	land

	Rep	oorting	Spike	Source		%REC		RPD	
Analyte	Result	Limit U.	nits Level	Result	%REC	Limits	RPD	Limit	Notes

Ratch	1100122	- FPA	3510/600	Carias
BAICH	1100100	- EFA	2210/000	beries

Batch 1100188 - EPA 3510/600 S	eries			
Blank (1100188-BLK1)				Prepared: 10/04/01 Analyzed: 10/10/01
Acenaphthene	ND	5.00	ug/l	
Accnaphthylene	ND	5.00	•	
Anthracene	ND	5.00	17	
Benzo (a) anthracene	ND	5.00	"	
Benzo (a) pyrene	ND	5.00		
Benzo (b) fluoranthene	ND	5.00	•	
Benzo (ghi) perylene	ND	5.00	11	
Benzo (k) fluoranthene	МD	5.00	"	
Benzoic Acid	ND	50.0	"	
Benzyl alcohol	ND	10.0	**	•
4-Bromophenyl phenyl ether	ND	5.00	**	
Butyl benzyl phthalate	DИ	5.00	11	
4-Chloro-3-methylphenol	ND	5.00	"	
4-Chloroaniline	ND	20.0	**	
Bis(2-chloroethoxy)methane	ND	10.0	-	
Bis(2-chloroethyl)ether	ND	5.00		
Bis(2-chloroisopropyl)ether	ND	10.0	"	
2-Chloronaphthalene	ND	5.00		
2-Chlorophenol	ND	5.00	49	
4-Chlorophenyl phenyl ether	NĎ	5.00	n	
Chrysene	ND	5.00		
Di-n-butyl phthalate	ND	5.00	н	
Di-n-octyl phthalate	ND	5.00		
Dibenzo (a,h) anthracene	ND	5.00	•	
Dibenzofuran	ND	5.00	~	
1,2-Dichlorobenzene	ND	5.00	#	
1,3-Dichlorobenzene	ND	5.00	n	
1,4-Dichlorobenzene	ND	5.00		
3,3'-Dichlorobenzidine	ND	5.00		
2,4-Dichlorophenol	ND	5.00	*	
Diethyl phthalate	ND	5.00	•	
2,4-Dimethylphenol	ND	10.0	**	
Dimethyl phthalate	ND	5.00	**	
4,6-Dinitro-2-methylphenol	ND	10.0	**	
2,4-Dinitrophenol	ND	25.0	•	
2,4-Dinitrotoluene	ND	5.00	п	

North Creek Analytical - Portland

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Lisa Domenighini, Project Manager

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Seattle 11720 North Creek Pkwy N, Suite 400, Bothell, WA 98011-8244 425,420,9200 fax 425,420,9210

Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776 509,924,9200 fax 509,924,9290

Spokane

509.324.3200 Tax 509.324.3250 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906.9200 fax 503.906.9210 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588

Hahn and Associates, Inc.

434 NW Sixth Ave., Suite 203 Portland, OR 97209

Project: T1 South

Project Number: 5106-010928 Project Manager: Guy Tanz

Reported:

10/18/01 11:13

Semivolatile Organic Compounds per EPA Method 8270C - Quality Control 12.

North	Creek A	Analytical	- Portland	

į .		Reporting		Spike	Source		%REC		RPD	
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Blank (1100188-BLK1)				Prepared: 10	/04/01 Analyz	ed: 10/10/01	
2,6-Dinitrotoluene	ND	5.00	ug/l				
Bis(2-ethylhexyl)phthalate	ND	10.0	**				
Fluoranthene	ND	5.00	**				-
Fluorene	ND	5.00	11				
Hexachlorobenzene	ND	5.00	**				
Hexachlorobutadiene	ND	10.0	n				
Hexachlorocyclopentadiene	ND	10.0	•				
Hexachloroethane	ND	10.0	*			-	
ndeno (1,2,3-cd) pyrene	ND	5.00	11				
sophorone	ND .	5.00	n				
2-Methylnaphthalene	ND	5.00	••				
2-Methylphenol	ND	10.0	"				
3-,4-Methylphenol	ND	5.00	•				
Naphthalene	ND	5.00	-				
-Nitroaniline	ND	5.00	•				
-Nitroaniline	ND	10.0	7				
I-Nitroaniline	ИD	10.0	"				
Nitrobenzene	ND	5.00					
2-Nitrophenol	ND	5.00					
4-Nitrophenol	ND	25.0	11				
N-Nitrosodi-n-propylamine	ND	10.0	~				
N-Nitrosodiphenylamine	ND	5.00	-				
Pentachlorophenol	ND	10.0	11				
Phenanthrene	ND	5.00	n				
Phenol	ND	5.00	ij				
yrene	ND	5.00	ij				
,2,4-Trichlorobenzene	ND	5.00	н				
2,4,5-Trichlorophenol	ND	5.00	n				
2,4,6-Trichlorophenol	ND	5.00	•				
Surr: 2-Fluorobiphenyl	21.0		-	75.0	28.0	26-135	
Surr: 2-Fluorophenol	60.1		*	150	40.1	6-124	
Surr: Nitrohenzene-d5	35.7		*	75.0	47.6	23-147	
Surr: Phenol-d6	38.0		n	150	25.3	11-130	
Surr: p-Terphenyl-d14	51.7		,	75. 0	68.9	38-149	
Surr: 2,4,6-Tribromophenol	138		п	150	92.0	19-126	

North Creek Analytical - Portland

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Seattle 11720 North Creek Pkwy N, Suite 400, Bothell, WA \$8011-8244 425.420.9200 fax 425.420.9210

East 11115 Montgomery, Suite B, Spokane, WA 99206-4776 509.924.9200 fax 509.924.9290 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132

Portland

503.906.9200 fax 503.906.9210

20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541,383,9310 fax 541,382,7588

Hahn and Associates, Inc. 434 NW Sixth Ave., Suite 203 Portland, OR 97209

Project: T1 South Project Number: 5106-010928 Project Manager: Guy Tanz

Reported: 10/18/01 11:13

Semivolatile Organic Compounds per EPA Method 8270C - Quality Control

	1101	til Cicck	Allaly	icai - L	n danu					
		Reporting		Spike	Source		%REC		RPD	
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 1100188 - EPA 3510/600 S	eries									
LCS (1100188-BS1)				Prepare	d: 10/04/0) i Analyz	ed: 10/11/0	01		
Acenaphthene	53.6	5.00	ug/!	75.0		71.5	40-110			
4-Chloro-3-methylphenol	147	5.00		150		98.0	40-110			
2-Chlorophenol	137	5.00	u	150		91.3	40-110			
1,4-Dichlorobenzene	20.6	5.00	**	75.0		27.5	20-90	_		
2,4-Dinitrotoluene	82.6	5.00	n	75.0		110	50-110			
1-Nitrophenol	58.4	25.0	H	150		38.9	15-100			
N-Nitrosodi-n-propylamine	56.8	10.0	#	75.0		75.7	40-110			
Pentachlorophenol	149	10.0	Ħ	150		99.3	30-120		•	
Phenol	45.6	5.00	•	150		30.4	15-110			
Pyrene	77.6	5.00	н	75.0		103	40-110			
1,2,4-Trichlorobenzene	22.2	5.00	-	75.0		29.6	25-100			
Surt: 2-Fluorobiphenyl	31.6		п	75.0		42.1	26-135			
Surr: 2-Fluorophenol	77. 5		*	150		51.7	6-124			
Surr: Nitrobenzene-d5	63.1		•	75.0		84.1	23-147			
Surr: Phenol-d6	47.7		"	150		31.8	11-130			
Surr: p-Terphenyl-d14	86.3		π	75.0		115	38-149			
Surt: 2,4,6-Tribromophenol	188		•	150		125	19-126			
LCS Dup (1100188-BSD1)				Prepare	ed: 10/04/0	Ol Analyz	ed: 10/10/0	01		
Acenaphthene	46.2	5.00	ug/l	75.0		61.6	40-110	14.8	36	
4-Chloro-3-methylphenol	113	5.00	•	150		75.3	40-110	26.2	43	
2-Chlorophenol	103	5.00	w	150		68.7	40-110	28.3	38	
1,4-Dichlorobenzenc	21.7	5.00	n	75.0		28.9	20-90	5.20	43	
2,4-Dinitrotolucne	64.7	5.00	n	75.0		86.3	50-110	24.3	31	
4-Nitrophenol	47.3	25.0	•	150		31.5	15-100	21.0	36	
N-Nitrosodi-n-propylamine	49.9	10.0	•	75.0		66.5	40-110	12.9	37	
Pentachlorophenol	124.	10.0	m	150		82.7	30-120	18.3	40	
Phenol	35.0	5.00	"	150		23.3	15-110	26.3	36	
Рутепе	66.4	5.00	n	75.0		88.5	40-110	15.6	31	
1,2,4-Trichlorobenzene	25.0	5.00	PP	75.0		33.3	25-100	11.9	42	
Surr: 2-Fluorobiphenyl	26.7		r	75.0	- Nag-	35.6	26-135			
Surr: 2-Fluorophenol	56.5		~	150		37.7	6-124			
Surr: Nitrobenzenc-d5	53.0		•	75.0		70.7	23-147			
Surr: Phenol-d6	36.4		rr .	150		24.3	11-130			
Surr: p-Terphenyl-d14	73.2		•	75.0		97.6	38-149			
Surr: 2,4,6-Tribromophenol	143		77	150		95.3	19-126			

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Seattle 11720 North Creek Pkwy N, Suite 400, Bothell, WA 98011-8244 425,420,9200 fax 425,420,9210

Spokane East I1115 Montgomery, Suite B, Spokane, WA 99206-4776 509.924.9200 fax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906.9200 fax 503.906.9210

Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711

541.383.9310 fax 541.382.7588

Hahn and Associates, Inc.

434 NW Sixth Ave., Suite 203 Portland, OR 97209

Project: T1 South

Project Number: 5106-010928 Project Manager: Guy Tanz

Reported:

10/18/01 11:13

Semivolatile Organic Compounds per EPA Method 8270C - Quality Control

North Creek Analytical - Portland

		Reporting		Spike	Source		%REC		RPD	
Analyte	Result	Limit	linite .	Level	Regult	%REC	Limits	R PD	Limit	Notes

Batch 1100188 - EPA 3510/600 Series

North Creek Analytical - Portland

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North Creek Analytical, Inc. **Environmental Laboratory Network**



 Seattle
 11720 North Creek Pkwy N, Suite 400, Bothell, WA 98011-8244 425,420,9200
 1ax 425,420,9210

 Spokane
 East 11115 Montgomery, Suite B, Sookane, WA 99206-4776 509,924,9200
 fax 509,924,9290

 Portland
 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503,906,9210
 969,9200
 fax 503,996,9210

 Bend
 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541,383,9310
 fax 541,382,7588

Hahn and Associates, Inc.

434 NW Sixth Ave., Suite 203 Portland, OR 97209

Project: T1 South

Project Number: 5106-010928 Project Manager: Guy Tanz

Reported:

10/18/01 11:13

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Quality Control

	Nort	h Creek	Analyt	ical - Po	ortland					
Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD.	RPD Limit	Notes

Blank (1100208-BLK1)				Prepared: 10/	04/01 Analyz	ed: 10/09/01		
Acenaphthene	ND	0.100	ug/l					
Acenaphthylene	ND	0.100	W					
Anthracene	ND	0.100						
Senzo (a) anthracene	ND	0.100						
спго (а) рутепе	ND	0.100	u					
senzo (b) fluoranthene	ND	0.100	n					
Benzo (ghi) perylene	ND	0.100	•					
lenzo (k) fluoranthene	ND	0.100	•					
Thrysene	ND	0.100	н					
Dibenzo (a,h) anthracene	ND	0.200	n					
luoranthene	ND	0.100	10					
luorene	ND	0.100						
ndeno (1,2,3-cd) pyrene	ND	0.100	n					
aphthalene	ND	0.100	=					
henanthrene	ND	0.100	п					
утепе	ND	0.100	"					
urr: Fluorene-d10	1.43		*	2.50	57.2	25-105		
urr: Pyrene-d10	1.94		u	2.50	77.6	30-130		
urr: Benzo (a) pyrene-d12	1.21		r	2.50	48.4	22-120	•	
CS (1100208-BS1)				Prepared: 10	/04/01 Analyz	ed: 10/08/01		
Аселарhthene	1.86	0.100	ug/l	2.50	74.4	26-135		
вепхо (а) рутепе	1.86	0.100	11	2.50	74.4	38-137		
утеле	1.99	0.100	н	2.50	79.6	33-133		
urr: Fluorene-d10	1.63		#	2.50	65.2	25-105		
Surr: Pyrene-d10	2.09		u u	2.50	83.6	30-130		
Surr: Benzo (a) pyrene-d12	1.38		,,	2.50	55.2	22-120		

North Creek Analytical - Portland

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· Lisa Domenighini, Project Manager

North Creek Analytical, Inc. **Environmental Laboratory Network**



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9405 SW Nimbus Avenue, Beaveron, OR 97008-7132 503.906.9200 fax 503.906.9210 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711

541.383.9310 fax 541.382.7588

Hahn and Associates, Inc.

Analyte

434 NW Sixth Ave., Suite 203 Portland, OR 97209

Project: TI South

Project Number: 5106-010928 Project Manager: Guy Tanz

Reported:

10/18/01 11:13

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Quality Control

	Reporting		Spike	Source		%REC		RPD	
Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 1100208 - EPA 3520/600 Series									
; LCS Dup (1100208-BSD1)				Prepared: 10	/04/01 Analyz	ed: 10/08/0	01		
Acenaphthene .	2.31	0.100	ug/l	2.50	92.4	26-135	21.6	60	
Penzo (a) pyrene	2.17	0.100	-	2.50	86.8	38-137	15.4	60	
Pyrene	2.45	0.100	n	2.50	98.0	33-133	20.7	60	
Surt: Fluorene-d10	1.90		n	2.50	76.0	25-105			
; Surr: Pyrene-d10	2.45		"	2.50	98.0	30-130			
Surr: Benzo (a) pyrene-dl2	1.52		•	2.50	60.8	22-120			

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Portland, OR 97209

Total Suspended Solids

Project: T1 South

Project Number: 5106-010928

Project Manager: Guy Tanz

Reported:

10/18/01 11:13

Conventional Chemistry Parameters per APHA/EPA Methods Quality Control

North Creek Analytical - Portland

			Reporting		Spike	Source		%REC		RPD	
Analyte	•	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Ratch 1100243 - Wat Char											

Batch 1100243 - Wet Chem				· · · · · · · · · · · · · · · · · · ·			
Blank (1100243-BLK1)				Prepared: 10/0	05/01 Analyz	ed: 10/09/01	
Total Suspended Solids	ND	1.00	mg/l				
LCS (1100243-BS1)				Prepared: 10/0	05/01 Analyz	ed: 10/09/01	
Total Suspended Solids	58.0	10.0	mg/l	60.0	96.7	80-120	
Duplicate (1100243-DHP1)	Sour	ca- D1 [0130	. 02	Prepared: 10/0	05/01 Analyz	ed: 10/09/01	

mg/l

ND

10.0

ND

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541.383.9310 fax 541.382.7588

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434 NW Sixth Ave., Suite 203

Portland, OR 97209

Project: T1 South

Project Number: 5106-010928

Project Manager: Guy Tanz

Reported:

10/18/01 11:13

Notes and Definitions

Q-06 Analyses are not controlled on RPD values from sample concentrations less than 5 times the reporting limit.

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit

NR Not Reported

dry Sample results reported on a dry weight basis. MRLs are adjusted if %Solids are less than 50%.

wet Sample results reported on a wet weight basis (as received)

RPD Relative Percent Difference

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HAHN AND ASSOCIATES,	NC.	La	borat	ory	NC	4					CHAI	NOF	CU	STODY
Environmental Managemen										-				1
434 NW Sixth Avenue, Suite 203 - Portland		Lat	Proje	ct No.						-	Chain of	Custody	No.	_X
(503) 796-0717 • Fax (503) 227-2205	<u> </u>												•••	
Project Manager 144 1447 Project No. 506		Liquid	Tost Pi		at Samp	l-a Test Sodijn			Tare Back	Samples I Appropris			_	ND
Project Name 715		Multi-	•	Sample		ser semi.	10114			Provide V				No
Collected by Matt Mudge				-	• .	Test Separ	otely			Provide P			_	YES
Sample Number Prefix:		Lapriz	1 1				nolyses	to be P		<u> </u>		_	_	
1 -			1				Jan Jaco			₹ _			1	
5706-011001-			1 I					4	g	50	`			
13:11 Port of Portlan	4		otainers	60 B (5)	ベゼー	PO STM	to DEHP)	10 AS,C.	_	O CELOCY SWINS	50.1			
	no	Water	1 2 1	24 82 (VC	He'L	A 8270	24 82 C	A 6016 CFELTE	14 6010 (UN)	A 601	24 AG (75)		RUSH	
Lab ID Sample # Date Time Samp	le Description	* 0	Z	Ü	CHI	モプロ	17	るらか	EPA FPA	6	i)			Remarks
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1107 1 10:38 MI		X	<u></u>			*						i 	$ \neg $	
	1-1	X	59	-	*		X	*	*		**	<u></u>		
) 00		a	*		*	*	*	*	1	*	} —		
109 12:20 MW	— 	X	4	*	*		*	*	*_	*	*			
110 1 13.25 Equ	ip. Blank	Λ.	1	*		— <u>-</u>	*_		ļ			<u>-</u>		
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Hahn and Associates, Inc. 434 NW Sixth Ave., Suite 203 Portland, OR 97209

Project Number: 5106-01 RECEIVED OCT 1 9 2001
Project Manager: Com. T.

Project Manager: Guy Tanz

Reported: 10/17/01 15:23

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled Date Receive
5106-011001-106	P1J0097-01	Water	10/01/01 09:03 - 10/02/01 16:
5106-011001-107	P1J0097-02	Water	10/01/01 10:38 10/02/01 16:
5106-011001-108	P1J0097-03	Water	10/01/01 12:18 10/02/01 16:
5106-011001-109	P1J0097-04	Water	10/01/01 12:20 10/02/01 16:
5106-011001-110	P130097-0S	Water	10/01/01 13:25 10/02/01 16:

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Lisa Domenighini, Project Manager

North Creek Analytical, Inc. Environmental Laboratory Network



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509.924.9200 1ax 509.924.9280 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906.9200 1ax 503.906.9210 Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588

Hahn and Associates, Inc.

434 NW Sixth Ave., Suite 203 Portland, OR 97209

Project: T1 South

Project Number: 5106-011001

Reported:

Project Manager: Guy Tanz

10/17/01 15:23

Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-011001-108 (P1J0097-03) Water					Sampled: 10/0	1/01 Rece	ived: 10/02/	01	
Diesel Range Organics	0.416	0.250	mg/l	1	NWTPH-Dx	10/03/01	10/04/01	1100139	D-15
Heavy Oil Range Hydrocarbons	ND	0.500	7	rs	н	tı .	41	ri	
Surr: 1-Chlorooctadecane	99.3 %	50-150							
5106-011001-109 (PIJ0097-04) Water					Sampled: 10/0	1/01 Rece	ived: 10/02/	01	
Diesel Range Organics	0.338	0.250	mg/I	1	NWTPH-Dx	10/03/01	10/04/01	1100139	D-15
Heavy Oil Range Hydrocarbons	ND	0.500	11		fi	er	ч	"	
Surr: 1-Chlorooctadecane	98.5 %	50-150			<u>—</u> .				

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Spokane East 11115 Montgomery, Suite B. Spokane, WA 99206-4776
509.924.9200 fax 509.924.9290

9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906.9200 fax 503.906.9210

20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588

Hahn and Associates, Inc.

434 NW Sixth Ave., Suite 203 Portland, OR 97209

Project: T1 South

Project Number: 5106-011001 Project Manager: Guy Tanz

Reported:

10/17/01 15:23

Total Metals per EPA 6000/7000 Series Methods

North Creek Analytical - Portland

, <u></u>			-						
Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-011001-106 (P1J0097-01) Water				5	Sampled: 10/0	1/01 Rece	ived: 10/02/0	01	
Arsenic	0.00138	0.00100	mg/l	i	EPA 6020	10/10/01	10/11/01	1100451	
Copper	ND	0.00200		b			н	۳	
Lead	0.00447	0.00100	•	н		п	μ	•	
5106-011001-107 (P1J0097-02) Water				5	Sampled: 10/0	1/01 Rece	ived: 10/02/	01	
Arsenic	0.0128	0.00100	mg/l	1	EPA 6020	10/10/01	10/11/01	1100451	•
Copper	ND	0.00200	#	h	*		H		
Lead	ND	0.00100	•		ŧı		v		
5106-011001-108 (PIJ0097-03) Water					Sampled: 10/0	1/01 Rece	ived: 10/02/	01	
Arsenic	0.00201	0.00100	mg/l]	EPA 6020	10/10/01	10/11/01	1100451	_
Cadmium	ND	0.00100	-	n	•	Ħ	tr		
Chromium	0.00325	0.00100	-	***	**	11	u	*	
Соррег	0.00474	0.00200	•	u	17	n		п	
Lead	0.00116	0.00100	•	**	n			n	
Mercury	ND	0.000200	**	11	EPA 7470A	10/11/01	10/12/03	1100490	
Nickel	0.00525	0.00200	н	**	EPA 6020	10/10/01	10/11/01	1100451	
Silver	ND	0.00100	**	*	. •	11	#	•	
Zinc	0.0106	0.00500	**	-	v	tr.	u u	n	
5106-011001-109 (P1J0097-04) Water					Sampled: 10/0	1/01 Rece	ived: 10/02/	01	
Arsenic	0.90106	0.00100	mg/l	1	EPA 6020	10/10/01	10/11/01	1100451	
Cadmium	ND	0.00100	"		**	•		*	
Chromium	0.00265	0.00100		,,	**	"	0	n	
Copper	0.00388	0.00200	•	10	7	11	•	n	
Lead	ND	0.00100	•	10	-	**	•	•	
Mercury	ИD	0.000200	٠	n	EPA 7470A	10/11/01	10/12/01	1100490	
, Nickel	0.00449	0.00200	•	•	EPA 6020	10/10/01	10/11/01	1100451	
Silver	ND	0.00100	" .	•	•	n	11	п	
Zinc	0.00843	0.00500	v	•	41	Ħ	11	ч	

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503.906.9200 fax 503.906.9210

20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588

Hahn and Associates, Inc.

434 NW Sixth Ave., Suite 203 Portland, OR 97209

Project: T1 South

Project Number: 5106-011001 Project Manager: Guy Tanz

Reported:

10/17/01 15:23

Dissolved Metals per EPA 6000/7000 Series Methods

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-011001-106 (P1J0097-01) Water		<u> </u>	 	(Sampled: 10/0	1/01 Recei	ived: 10/02/	01	
Arsenic	ND	0.00100	mg/l	1	EPA 6020	10/12/01	10/16/01	1100551	
Copper	ND	0.00200	п	11	•	p	•	11	
Lead	ND	0.00100		**	**	•	٠	Ħ	
5106-011001-107 (P1J0097-02) Water					Sampled: 10/0	1/01 Recei	ived: 10/02/	01	
Arsenic	0.0145	0.00100	mg/l	1	EPA 6020	10/12/01	10/16/01	1100551	
Copper	ND	0.00200	-	11	**	*	•	•	
Lead	ND	0.00100	"	"	tī	h	•	*	
5106-011001-108 (P1J0097-03) Water					Sampled: 10/0	1/01 Rece	ived: 10/02/	01	
Arsenic	ND	0.00100	mg/l	ı	EPA 6020	10/12/01	10/16/01	1100551	
Copper	0.00229	0.00200	n .	•	-	*	14		
Lead	0.00137	0.00100	*	**	*	-	q	**	
5106-011001-109 (PiJ0097-04) Water					Sampled: 10/0	1/01 Rece	ived: 10/02/	01	
Arsenic	ND	0.00100	mg/l	1	EPA 6020	10/12/01	10/16/01	1100551	
Copper	0.00203	0.00200	**	"	. 11	n	н	н	
Lead	ND	0.00100	11	•	•	H	"	u	

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Hahn and Associates, Inc. 434 NW Sixth Ave., Suite 203 Portland, OR 97209

Project: T1 South Project Number: 5106-011001

Reported: 10/17/01 15:23

Volatile Organic Compounds per EPA Method 8260B

Project Manager: Guy Tanz

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-011001-108 (P1J0097-03) Water				9	Sampled: 10/0	1/01 Recei	ived: 10/02/0	01	
Acetone	ND	25.0	ug/l	1	EPA 8260B	10/04/01	10/04/01	1100190	
Benzene	ND	1.00	11	н	h	n	h	-	
Bromobenzene	ND	1.00		n	tr.	*			
Bromochloromethane	ND	1.00	*	11	•	**	*	TI TI	
Bromodichloromethane	ND	1.00		n	•	•	•		
Bromoform	ND	1.00	n	**	41	•	41	•	
Bromomethane	ND	5.00		•	92	•	n	n	
2-Butanone	ND	10.0	•	п	ts.	11	n	•	
n-Butylbenzene	ND	5.00	#	**	**	ч	н	•	
sec-Butylbenzene	ND	1.00	u	n .	**	11	17	11	
tert-Butylbenzene	ND	1.00		n	•	"		h	
Carbon disulfide	ND	10.0	•	11	•		•	u	
Carbon tetrachloride	ND	1.00	u	n	h	4	**	н	
Chlorobenzene	ND	1.00	•	-	u	11	"	h	
Chloroethane	ND	1.00			h		,,	•	
Chloroform	ND	1.00		11	n	n	12	*	
Chloromethane	ND	5.00	*1			ti	rr ·	n	
2-Chlorotoluene	ND	1.00	*	n	-	"	•	u	
4-Chlorotoluene	ND	1.00	**	n	**	•	n	**	
1,2-Dibromo-3-chloropropane	ND	5.00			n	17	**	ø	
Dibromochloromethane	ND	1.00	•	-	**	"	. ,	**	
1,2-Dibromoethane	ND	1.00	•	*	**		u	•	
Dibromomethane	ND	1.00	11	ti.	n	n	ţl.		
1,2-Dichlorobenzene	ND	1.00	n	q	•	п	•	h	
1,3-Dichlorobenzene	ND	1.00		11	**	•	7		
1,4-Dichlorobenzene	ND	1.00		n	11	#	er e	n	
Dichlorodifluoromethane	ND	5.00	17	п	n	u	"	n	
1,1-Dichlorocthane	ND	1.00			"	ď	U	•	
1,2-Dichloroethane	ND	1.00	•	н	**	11	n		
1,1-Dichloroethene	ND	1.00	•	н		11	"	u	
cis-1,2-Dichloroethene	ND	1.00	n		-		-	tt	
trans-1,2-Dichloroethene	ND	1.00	**	"	**		••	Р	
1,2-Dichloropropane	ND	1.00	11	11	н	11	19	I)	
1,3-Dichloropropane	ND	1.00	n	r	н	Ħ	**		
2,2-Dichloropropane	ND	1.00	н	-			n	•	
1.1-Dichloropropene	ND	1.00	*	,,	31	"		n	
cis-1,3-Dichloropropene	ND	1.00	-	11	n	*1	-	ti	
trans-1,3-Dichloropropene	ND	1.00	H	**	•	•	-	to .	
Ethylbenzene	ND	1.00	P	ıı	•	*	41	u	

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Lisa Domenighini, Project Manager

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Spokano East 11115 Montgomery, Suite B, Spokano, WA 99206-4776 509,924,9200 fax 509,924,9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906 9200 fax 503.906 9210

Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588

Hahn and Associates, Inc. 434 NW Sixth Ave., Suite 203

Portland, OR 97209

Project: T1 South

Project Number: 5106-011001 Project Manager: Guy Tanz

Reported: 10/17/01 15:23

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Sampled: 10/01/01 Received: 10/02/01	Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2-Hexanone ND 10.0	5106-011001-108 (P1J0097-03) Water	· -				Sampled: 10/0	1/01 Rece	ived: 10/02/	01	
Sopropylbenzene ND 2.00	Hexachlorobutadiene	ND	2.00	ug/l	l	EPA 8260B	10/04/01	10/04/01	1100190	
p-Isopropyltoluene	2-Hexanone	ND	10.0			n	•	ti	Ħ	
4-Methyl-2-pentanone ND 5.00 """"""""""""""""""""""""""""""""""""	Isopropylbenzene	ND	2.00	er er	•	и		•	**	
Methyl tert-butyl ether ND 1.00 """"""""""""""""""""""""""""""""""""	p-Isopropyltoluene	ND	2.00	**	n	**	н	n	#	
Methyl tertr-butyl ether ND 1.00 """"""""""""""""""""""""""""""""""""	,	ND	5.00		11		-	"	#	
Methylcne chloride ND 5.00 """"""""""""""""""""""""""""""""""""	· ·	ND	1.00	r		Ħ	•	,,	#	
Naphthalene	•	ND	5.00		u	n)r			
ND ND ND ND ND ND ND ND	•	ND	2.00	**	r	"	•	•		
Styrene ND 1.00		ND	1.00	67		**		**	,	
1,1,1,2-Tetrachloroethane ND 1.00 """"""""""""""""""""""""""""""""""""			1.00	a a		u	11	••		
1,1,2,2-Tetrachloroethane			1.00		0	π	n	17		
Tetrachloroethene 2.76 1.00 "			1.00	-	**	-	п	u	**	
1,2,3-Trichlorobenzene ND 1.00 " " " " " " " " " " " " " " " " " " "			1.00	11	**	•	a	.,	ч	
1,2,4-Trichlorobenzene ND 1.00 " " " " " " " " " " " " " " " " " "	Toluene	ND	1.00	13	11	п		-		
1,2,4-Trichlorobenzene ND 1.00 " " " " " " " " " " " " " " " " " " "	1.2.3-Trichlorobenzene	ND	1.00	n		*	•	11	n	
1,1,1-Trichloroethane			1.00	51	•	n	n	11	u	
Trichloroethene ND 1.00 " " " " " " " " " " " " " " " " " " "	• •			r	m	•	'n	н	*	
Trichloroethene ND 1.00 " " " " " " " " " " " " " " " " " " "	1,1,2-Trichloroethane	ND	1.00	-	ti.	-	"	17	*	
Trichlorofluoromethane ND 1.00 """"""""""""""""""""""""""""""""""""		ND	1.00	n	**	*	**	•	n	
1,2,3-Trichloropropane ND 1.00 " " " " " " " " " " " " " " " " " " "		ND	1.00	μ	10	n	n n	*		
1,2,4-Trimethylbenzene ND 1.00 " " " " " " " " " " " " " " " " " "		ND	1.00	н		н		H	tt	
1,3,5-Trimethylbenzene ND 1.00 " " " " " " " " " " " " " " " " " " "			1.00	11	•	, н	•	**	n	
Vinyl chloride ND 1.00 "		ND	1.00	•	•	•	u u	H	17	
m,p-Xylene ND 2.00 " " " " " " Surr: 4-BFB 112 % 75-125 Surr: 1,2-DCA-d4 104 % 75-125	•	ND	1.00		11	~	11	n	-	
m,p-Xylene ND 2.00 " " " " " " " " " " " " " " " " " " "	o-Xylene	ND	1.00		D		•	•	n	
Surr: 1,2-DCA-d4 104 % 75-125				н	#	н		н		
Surr: 1,2-DCA-d4 104 % 75-125	Surr: 4-BFB	112%	75-125							
	Surr: 1,2-DCA-d4		75-125							
	Surr. Dibromofluoromethane	106 %	75-125							
Surr: Toluene-d8 104 % 75-125		104 %	75-125							

North Creek Analytical - Portland

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Lisa Domenighini, Project Manager

North Creek Analytical, Inc. Environmental Laboratory Network



475.420.9200 fax 425.420.9210

Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
509.924.9200 fax 509.924.9290

Portland 9405 SW Nimbus Avenuc, Beaverton, OR 97008-7132

503.906.9200 fax 503.906.9210

Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711

541.383.9310 fax 541.382.7588

Hahn and Associates, Inc.

434 NW Sixth Ave., Suite 203

Portland, OR 97209

Project: T1 South

Project Number: 5106-011001

Project Manager: Guy Tanz

Reported: 10/17/01 15:23

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Алајуtе	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-011001-109 (P1J0097-04) Water				S	Sampled: 10/0	1/01 Recei	ved: 10/02/()1	
Acetone	ND	25.0	ug/l	1	EPA 8260B	10/04/01	10/04/01	1100190	
Benzene	ND	1.00	•	n	•		•	Ħ	
Bromobenzene	ND	1.00	**	11	n	**	**	Ħ	
Bromochloromethane	ND	1.00	n	н	11	n	11	ti	
Bromodichloromethane	ND	1.00	11	n	r	•	"		
Bromoform	ND	1.00	n	n	•	*	•	11	
Bromomethane	ND	5.00	•		•	**	۳	11	
2-Butanone	ND	10.0	-	n	ч	10	11	R	
n-Butylbenzene	ND	5.00	• .	•	**		н	r	
sec-Butylbenzene	ND	1.00	e	-	n	•	•	•	
tert-Butylbenzene	ND	1.00	n	11	•	•	-	u	
Carbon disulfide	ND	10.0	h	u	n	n	n	Ħ	
Carbon tetrachloride	ND	1.00	*	,,	11	· n	•	п	
Chlorobenzene	ND	1.00	-	n	•	н	ı)	Ħ	
Chloroethane	ND	1.00	n	"	*	n	19		
Chloroform	ND	1.00	ŧ7	#		"	19	н	
Chloromethane	ND	5.00	**	ır	n	et	n	*	
2-Chlorotoluene	ND	1.00	-	•	Ħ		ıı	,	
4-Chlorotoluene	ND	1.00	*	•	n	H		•	
1,2-Dibromo-3-chloropropane	ND	5.00	-	4	#	•	•	-	
Dibromochloromethane	ND	1.00	"	•	n	•	•	μ	
1,2-Dibromoethane	ND	1.00	u	,,	ħ	#	•	н	
Dibromomethane	ND	1.00	n		b	n	10	**	
1,2-Dichlorobenzene	ND	1.00	9	***	1	Ħ	n	"	
1,3-Dichlorobenzene	ND	1.00		н		b	H	11	
1,4-Dichlorobenzene	ND	1.00	n	"	•	**	11	**	
Dichlorodifluoromethane	ND	5.00	н	n	₹1	n	82		
1,1-Dichloroethane	ND	1.00	*			\$1	n	-	
1,2-Dichloroethane	ND	1.00	-	•		H	17	n	
1,1-Dichloroethene	ND	1.00	n	п		-	•	n	
cis-1,2-Dichloroethene	ND	1.00	n	II .		n	,	n	
trans-1,2-Dichloroethene	ND	1.00	ti .	11	••	•	11	**	
1,2-Dichloropropane	ND	1.00	•	**	r	rı	"	v	
1,3-Dichloropropane	ND	1.00		,,	-	*	**	n	
2,2-Dichloropropane	ND	1.00				•	••	tı	
1,1-Dichloropropene	ND	1.00	**	tr	n	17	**	**	
cis-1,3-Dichloropropene	ND	1.00		•	11	**	11	•	
trans-1,3-Dichloropropene	ND	1.00	-	-	•	ı,	u	•	
Ethylbenzene	ND	1.00	•	•	**	-	r	n	

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Lisa Domenighini, Project Manager

North Creek Analytical, Inc. **Environmental Laboratory Network**



 Seattle
 11720 North Creek Pkwy N, Suite 400, Bothell, WA 98011-8244 425,420.9200
 fax 425,420.9210

 Spokane
 East 11115 Montgomery, Suite B, Spokane, WA 99205-4776 503,924,9200
 fax 509,924,9290

Portland 9405 SW Nimbus Avenue, Beaverton, 0R 97008-7132 503,906,9200 fax 503,906,9210 20332 Empire Avenue, Suite F-1, Bend, 0R 97701-5711 541,383,9310 fax 541,382,7588

Hahn and Associates, Inc. 434 NW Sixth Ave., Suite 203

Portland, OR 97209

Project: T1 South

Project Number: 5106-011001

Reported:

Project Manager: Guy Tanz

10/17/01 15:23

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
,5106-011001-109 (P1J0097-04) Water					Sampled: 10/0	1/01 Recei	ved: 10/02/0	01	
Hexachlorobutadiene	ND	2.00	ug/l	t	EPA 8260B	10/04/01	10/04/01	1100190	
³ 2-Hexanone	ND	10.0	,,	n	n	11	"	-	
Isopropylbenzene	ND	2.00	н	**			•	**	
p-Isopropyltoluene	ND	2.00	11	**	*	*	n	**	
14-Methyl-2-pentanone	ND	5.00	r	n	**	v	"	**	
Methyl tert-butyl ether	ND	1.00	-	•	•		•	11	
Methylene chloride	ND	5.00	×	'n	41	n	п	n	
Naphthalene	ND	2.00	**	l y	*	IF	11	•	
n-Propylbenzene	ND	1.00	•	u	. "			27	
Styrene	ND	1.00	13	11	"	π	11	n	
1,1,1,2-Tetrachloroethane	ND	1.00		tr .			Р.	0	
: 1,1,2,2-Tetrachloroethane	ND	1.00	•		•	*	•	#	
Tetrachloroethene	3.29	1.00	н	**	11	+5	Ħ	-	
: Toluene	ND	1.00	**	n	n	n	n	•	
1,2,3-Trichlorobenzene	ND	1.00	**	н	#	•	9	n	
1,2,4-Trichlorobenzene	ND	1.00	ч	11	n	•	u		
1,1,1-Trichloroethane	ND	1.00	H	77	•	tr	*	•	
1,1,2-Trichloroethane	ND	1.00	•	-	**		n	17	
Trichloroethene	ND	1.00	11	18	31	n n	Ħ	-	
Trichlorofluoromethane	ND	1.00		**		n	H	н	
1,2,3-Trichloropropane	ND	1.00	n	n	*	•	"		
1,2,4-Trimethylbenzene	ND	1.00	11	n		n	tr		
1,3,5-Trimethylbenzene	ND	1.00					•	11	
Vinyl chloride	ND	1.00	-	*	н		n		
o-Xylene	ND	1,00	43	11	tt	n	п	**	
m,p-Xylene	. ND	2.00	-11		"	• ·	4,	91	
Surr: 4-BFB	114%	75-125							
Surr: 1,2-DCA-d4	110%	75-125							
Surr: Dibromofluoromethane	110%	75-125							
Surr: Toluene-d8	106 %	75-125							

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· Lisa Domenighini, Project Manager

North Creek Analytical, Inc. **Environmental Laboratory Network**



425.420.9200 fax 425.420.9210

Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
509.924.9200 fax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132

503.906.9200 fax 503.906.9210

Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588

Hahn and Associates, Inc. 434 NW Sixth Ave., Suite 203

Portland, OR 97209

Project: T1 South

Project Number: 5106-011001 Project Manager: Guy Tanz

Reported: 10/17/01 15:23

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
, 5106-011001-110 (P1J0097-05) Water					Sampled: 10/0	1/01 Recei	ived: 10/02/0	01	
Acetone	ND	25.0	ug/l	1	EPA 8260B	10/04/01	10/04/01	1100190	
Benzene	ND	1.00		**	n	•	n	. "	
Bromobenzene	ND	1.00	-		"	IT	n		
Bromochloromethane	ND	1.00	**	Ħ	"	11	#		
i Bromodichloromethane	ND	1.00	u	11	н	H	4	•	
Bromoform	ND	1.00	**	U	11	-	U	*	
} Bromomethane	ND	5.00		u	17	п	п	11	
2-Butanone	ND	10.0	*	n	H	**	•	11	
n-Butylbenzene	ND	5.00	n	n		. n			
sec-Butylbenzene	ND	1.00	11	m	n	10	"	n	
tert-Butylbenzene	ND	1.00		"	*	"	77	n	
Carbon disulfide	ND	10.0	-	•	**	"	47	17	
Carbon tetrachloride	ND	1.00	•	*	**	#	17		
: Chlorobenzene	ND	1.00	77	11	n	,,	n		
Chloroethane	ND	1.00	**	11	**	-	n	-	
Chloroform	ND	1.00	**	**		•	**	11	
Chloromethane	ND	5.00				**	"	•	
2-Chlorotoluene	ND	1.00	**	11	•	11	-		
· 4-Chlorotoluene	ND	1.00	"	9	-	**	4	,,	
1,2-Dibromo-3-chloropropane	ND	5.00	u	**		**	11	n	
Dibromochloromethane	ND	1.00	**	-	II .	a	ü	n	
1,2-Dibromoethane	ND	1.00	•	11	u u	11	ï	H	
Dibromomethane	ND	1.00	**	n	н .	ır	11	n	
. 1,2-Dichlorobenzene	ND	1.00	11	н	н	•	n	*	
1,3-Dichlorobenzene	ND	1.00	и	H	н	•	n	*1	
1,4-Dichlorobenzene	ND	1.00	н	n	17	**	17	n	
Dichlorodifluoromethane	ND	5.00		11	H	u	•	•	
1,1-Dichloroethane	ND	1.00	41	n	•	n	•	**	
1,2-Dichloroethane	ND	1.00	11	"	41		11	н	
1,1-Dichloroethene	ND	1.00		•	n	•	51	n	
cis-1,2-Dichloroethene	ND	1.00	•	•	n	*	0	п	
trans-1,2-Dichloroethene	ND	1.00	•	**	n	II .	."		
· 1,2-Dichloropropane	ND	1.00	•	1)	19	**		n	
1,3-Dichloropropane	ND	1.00	10	"	н	-		v	
2,2-Dichloropropane	ND	1.00	•		•	4	п	*	
1,1-Dichloropropene	ND	1.00	•		H	11	•	n	
cis-1,3-Dichloropropene	ND	1.00	*	u	-	v)	•	•	
trans-1,3-Dichloropropene	ND	1.00	n	11	n	n	π	11	
Ethylbenzene	ND	1.00	n	*	ir		а	*	

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Lisa Domenighini, Project Manager

North Creek Analytical, Inc. **Environmental Laboratory Network**



 Seattle
 11720 North Creek Pkwy N, Suite 400, Bothell, WA 98011-8244

 425.420.9200
 fax 425.420.9210

 Spokane
 East 11115 Montgomery, Suite B, Spokane, WA 99205-4776

509.924.9200 fax 509.924.9290 Pontland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906.9200 fax 503.906.9210

20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541,383,9310 fax 541,382,7588

Hahn and Associates, Inc. 434 NW Sixth Ave., Suite 203 Portland, OR 97209

Project: T1 South

Project Number: 5106-011001 Project Manager: Guy Tanz

Reported: 10/17/01 15:23

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-011001-110 (P1J0097-05) Water		_			Sampled: 10/0	1/01 Rece	ived: 10/02/	01	
Hexachlorobutadiene	ND	2.00	ug/l	1	EPA 8260B	10/04/01	10/04/01	1100190	
2-Hexanone	ND	10.0		"	•	77	et et	•	
Isopropylbenzene	ND	2.00	ŧı	"	n	•	"	r	
p-Isopropyltoluene	ND	2.00		•	17	n	11	Ħ	
4-Methyl-2-pentanone	ND	5.00	-	t*		n	n	••	
Methyl tert-butyl ether	ND	1.00	77	•	•	#	"	11	
Methylene chloride	ND	5.00	11	11	*1	*	•	n	
Naphthalene	ND	2.00	*	11	11	n	n	Ħ	
n-Propylbenzene	ND	1.00	**	11	19	н	. n	-	
Styrene	ND	1.00	11	*1	19	••	, .	ti	
1,1,1,2-Tetrachloroethane	ND	1.00			н	"	q	=	
1,1,2,2-Tetrachloroethane	ND	1.00	-		-	#	đ	•	
Tetrachloroethene	ND	1.00	н	•	•		•	ti .	
Toluene	ND	1.00	**	Ħ	**	n		17	
1,2,3-Trichlorobenzene	ND	1.00	**		11	u		•	
1,2,4-Trichlorobenzene	ND	1.00	**	"	**		10	-	
1,1,1-Trichloroethane	ND	1.00	11				H	e e	
1,1,2-Trichloroethane	ND	1.00			17	**	n	11	
Trichloroethene	ND	1.00	,	10	-	**	n		
Trichlorofluoromethane	ND	1.00		•	44	•	•	н	
1,2,3-Trichloropropane	ND	1.00	n	n	n	11	#	an an an an an an an an an an an an an a	
1,2,4-Trimethylbenzene	ND	1.00	,,,	n		и	u	-	
1,3,5-Trimethylbenzene	ND	1.00	11	n	n	•	11	-	
Vinyl chloride	ND	1.00	11	11	n	•	u	-	
o-Xylene	ND	1.00	n	n.	•	u	"	н	
m,p-Xylene	DN	2.00		n	.	*	н	H	
Surr: 4-BFB	111 %	75-125							
Surr: 1,2-DCA-d4	112 %	75-125							
Surr: Dibromofluoromethane	104 %	75-125							
Surr: Toluene-d8	106 %	75-125							

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Lisa Domenighini, Project Manager

North Creek Analytical, Inc. **Environmental Laboratory Network**



Seattle 11720 North Creek Pkwy N, Suite 400, Bothell, WA 98011-8244 425.420.9200 fax 425.420.9210
Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776 509.924.9200 fax 509.924.9290
Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906.9200 fax 503.906.9210

20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588

Hahn and Associates, Inc.

434 NW Sixth Ave., Suite 203

Portland, OR 97209

Project: T1 South

Project Number: 5106-011001

Project Manager: Guy Tanz

Reported:

10/17/01 15:23

Semivolatile Organic Compounds per EPA Method 8270C

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-011001-106 (P1J0097-01) Water					Sampled: 10/01	/01 Recei	ived: 10/02/0	01	
Bis(2-ethylhexyl)phthalate	ND	10.0	ug/l	1	EPA 8270C	10/04/01	10/11/01	1100188	
Surr: 2-Fluorobiphenyl	64.8 %	26-135							
Surr: Nitrobenzene-d5	91.9%	23-147							
Surr: p-Terphenyl-d14	122 %	38-149							
5106-011001-107 (P1J0097-02) Water					Sampled: 10/01	/01 Recei	ived: 10/02/	01	
Bis(2-ethylhexyl)phthalate	ND	10.0	ug/I	1	EPA 8270C	10/04/01	10/10/01	1100188	
Surr: 2-Fluorobiphenyl	65.8 %	26-135							
, Surr: Nitrobenzene-d5	82.5 %	23-147							
Surr: p-Terphenyl-d14	116%	38-149							
5106-011001-108 (P1J0097-03) Water					Sampled: 10/01	/01 Rece	ived: 10/02/	01	
Bis(2-ethylhexyl)phthalate	ND	10.0	ug/l	1	EPA 8270C	10/04/01	10/11/01	1100188	
Surr: 2-Fluorobiphenyl	58.4 %	26-135			<u>-</u>				
Surr: Nitrobenzene-d5	79.8 %	23-147							
Surr: p-Terphenyl-d14	110 %	38-149							
5106-011001-109 (P1J0097-04) Water					Sampled: 10/01	1/01 Rece	ived: 10/02/	01	
Bis(2-ethylhexyl)phthalate	ND_	10.0	ug/l	1	EPA 8270C	10/04/01	10/11/01	1100188	
Surr: 2-Fluorobiphenyl	67.4 %	26-135							
Surr: Nitrobenzene-d5	79.7 %	23-147							
Surr: p-Terphenyl-d14	119%	38-149							
5106-011001-110 (P1J0097-05) Water					Sampled: 10/01	1/01 Rece	ived: 10/02/	01	
. Bis(2-ethylhexyl)phthalate	ND	10.0	ug/l	i	EPA 8270C	10/04/01	10/10/01	1100188	
Surr: 2-Fluorobiphenyl	52.5 %	26-135							
Surr: Nitrobenzene-d5	71.4 %	23-147							
Surr: p-Terphenyl-d14	108 %	38- <i>149</i>							

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Lisa Domenighini, Project Manager

North Creek Analytical, Inc. Environmental Laboratory Network



.425,420,9280 fax 425,420,9210 Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776 509,924,9280 fax 509,924,9280

Portland 9405 SW Nimbus Avenue, Beaverton, 08 97008-7132 503.906.9200 fax 503.906.9210 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 tax 541.382.7588

Hahn and Associates, Inc. 434 NW Sixth Ave., Suite 203

Portland, OR 97209

Project: T1 South

Project Number: 5106-011001 Project Manager: Guy Tanz

Reported: 10/17/01 15:23

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

		ui Cicck			- tranu			· · · · · · · · · · · · · · · · · · ·	
Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-011001-106 (P1J0097-01) Water					Sampled: 10/0	1/01 Recei	ived: 10/02/0	01	
Acenaphthene	ND	0.100	ug/l	1	EPA 8270m	10/04/01	10/08/01	1100208	
Acenaphthylene	ND	0.100	"	n	n	*	11	*	
Anthracene	ND.	0.100	**	n	n	rr ·	13	•	
Benzo (a) anthracene	ND	0.100	n	*	н		•	*	
Benzo (a) pyrene	ND	0.100	-	7	51	11	•	11	
Benzo (b) fluoranthene	ND	0.100	•	n	11	11	•	•	
Benzo (ghi) perylene	ND	0.100	•	w	n	n	n		
Benzo (k) fluoranthene	ND	0.100	11	**	*	n	н		
Chrysene	ИD	0.100	n	31	*	11	**	n	
Dibenzo (a,h) anthracene	ND	0.200	•	**	**	n	12		
Fluoranthene	ND	0.100		"	D	•	10	-	
Fluorene	ND	0.100	4		n	-		•	
Indeno (1,2,3-cd) pyrene	ND	0.100	~	•	\$1	•	н	п	
Naphthalene	ND	0.100	-	***	11	ч	•	n	
Phenanthrene	0.153	0.100	•	•	n .	,,	-	H	
Pyrene	0.153	0.100	39	n	P.	n	U	10	
Surr: Fluorene-d10	70.0 %	25-105							
Surr: Pyrene-d10	91.7%	30-130							
Surr: Benzo (a) pyrene-d12	57.9 %	22-120							
5106-011001-107 (P1J0097-02) Water				:	Sampled: 10/0	1/01 Rece	ived: 10/02/	01	
Acenaphthene	0.121	0.100	ug/l	1	EPA 8270m	10/04/01	10/08/01	1100208	
Acenaphthylene	ND	0.100	=	u	n	H	•	11	
Anthracene	ND	0.100	*	**			Ħ		
Benzo (a) anthracene	ND	0.100	EP .	**	-	*	а	n	
Benzo (a) pyrene	ND	0.100	t.	11	•	*		h	
Benzo (b) fluoranthene	ND	0.100	,,		••	n	17	n	
Benzo (ghi) perylene	ND	0.100	97		n	-	u	•	
Benzo (k) fluoranthene	ND	0.100	н	*	tt	*	п	•	
Chrysene	ND	0.100	-	m	н	n	-	ti	
Dibenzo (a,h) anthracene	ND	0.200	•	**	**	*	•	Ni .	
Fluoranthene	0.119	0.100	•	n	rr ·	**	P	н	
Fluorene	ND	0.100	ч	u	tP.	**	ıı	Ħ	
Indeno (1,2,3-cd) pyrene	ND	0.100	•	u	-	**	u	u	
Naphthalene	ND	0.100	-		π.	•	n	h	
Phenanthrene	1.25	0.100	,	-	•	41	11	•	
Pyrene	0.564	0.100	**	p	n		11	-	

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Lisa Domenighini, Project Manager

North Creek Analytical, Inc. **Environmental Laboratory Network**



Seattle 11720 North Creek Pkwy N, Suite 400, Bothelt, WA 98011-8244 425.420.9200 fax 425.420.9210

East 11115 Montgomery, Suite 8, Spokane, WA 99206-4776 509.924.9200 fax 599.924.9290 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132

Portland

503.906.9200 fax 503.906.9210

20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588

Hahn and Associates, Inc.

434 NW Sixth Ave., Suite 203 Portland, OR 97209

Project: TI South

Project Number: 5106-011001

Reported:

Project Manager: Guy Tanz

10/17/01 15:23

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-011001-107 (P1J0097-02) Water					Sampled: 10/0	1/01 Rece	ived: 10/02/	01	
Surr: Pyrene-d10	82.6 %	30-130	······································		· · · · · · · · · · · · · · · · · · ·		<u></u>		
Surr: Benzo (a) pyrene-d12	47.9 %	22-120							
5106-011001-108 (P1J0097-03) Water					Sampled: 10/0	1/01 Rece	ived: 10/02/	01	
Acenaphthene	ND	0.100	ug/l	i	EPA 8270m	10/04/01	10/08/01	1100208	
Acenaphthylene	ND	0.100	ņ	"	*	•	-	•	
Anthracene	ND	0.100		н	v	n	7	ŧı	
Benzo (a) anthracene	ND	0.100	br	н	н	n	11	p	
Benzo (a) pyrene	ND	0.100	P	n n		•	н	*	
Benzo (b) fluoranthene	ИD	0.100		17	Ħ	•	*	. •	
Benzo (ghi) perylene	ND	0.100			#	₩.	**		
Benzo (k) fluoranthene	ND	0.100	u	-	"	Ħ	n	H	
Chrysene	ND	0.100	**	•	•	H	*	-	
Dibenzo (a,h) anthracene	ND	0.200	•	1f	#	"	•		
Fluoranthene	ND	0.100	**	"	11	n	•	ħ	
Fluorene	ND	0.100	41	4	19	"	-	n	•
Indeno (1,2,3-cd) pyrene	ND	0.100	n	**	10		0	n	
Naphthalene	ND	0.100	-	11	11	•	tt	р	
Phenanthrene	ND	0.100	-		n		•	н	
Рутепе	ND	0.100	11	•	ń	n	11	н	
Surr: Fluorene-d10	71.4 %	25-105	*****						
Surr: Pyrene-d10	103 %	30-130							
Surr: Benzo (a) pyrcne-d12	66.0 %	22-120							
5106-011001-109 (P1J0097-04) Water					Sampled: 10/0	1/01 Rece	eived: 10/02/	/O1	
Acenaphthene	ND	0.100	ug/I	i	EPA 8270m	10/04/01	10/08/01	1100208	
`Acenaphthylene	ND	0.100	•		"	4	*	h	
Anthracene	ND	0.100		•		и	n	n	
Benzo (a) anthracene	ND	0.100	"	-		u		n	
Benzo (a) pyrene	ND	0.100	p	•	•	**	н	•	
Benzo (b) fluoranthene	ND	0.100	,	n	**	ь	-	-	
Benzo (ghi) perylene	ND	0.100	14	0	•	"	•	77	
Benzo (k) fluoranthene	ND	0.100	19	"		11	77	a	
Chrysene	ND	0.100	11	51	*	•	н	ч	
Dibenzo (a,h) anthracene	ND	0.200	-	n		-	n		
Fluoranthene	ND	0.100	"	n	n	**	tr	33	
Fluorene	ND	001.0	*		н	•		•	
Indeno (1,2,3-cd) pyrene	ND	0.100	*1	n	• •		и	u	
		V.100							

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Lisa Domenighini, Project Manager

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Seattle 11720 North Creek Pkwy N, Spite 400, Bothell, WA 98011-8244 425.420.9200 fax 425.420.9210

Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776 509.924.9200 fax 509.924.9290

909.924, 9200 1ax 509.924, 9290

Portland 9405 SW Nimbus Avenue, Beaverton, DR 97008-7132
503.906.9200 fax 503.906.9210

Bend 20332 Empire Avenue, Suite F-1, Bend, DR 97701-5711
541.383.9310 fax 541.382.7588

Hahn and Associates, Inc. 434 NW Sixth Ave., Suite 203 Project: T1 South

Project Number: 5106-011001

Reported:

Portland, OR 97209

Project Manager: Guy Tanz

10/17/01 15:23

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-011001-109 (P1J0097-04) Water					Sampled: 10/0	1/01 Rece	ived: 10/02/	01	
Naphthalene	ND	0.100	ug/l	I	EPA 8270m	10/04/01	10/08/01	1100208	
Phenanthrene	ND	0.100	n	Ħ	11	Ħ	**	₩	
Рутепе	ND	0.100	•	Ħ	u .	*	•	•	
Surr: Fluorene-d10	122 %	25-105							A-10,S-08
Surr: Pyrene-d10	175 %	30-130							A-10,S-08
Surr: Benzo (a) pyrene-d12	114%	22-120						•	A-10

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Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7568

Hahn and Associates, Inc. 434 NW Sixth Ave., Suite 203 Portland, OR 97209

Project: T1 South Project Number: 5106-011001

Reported: 10/17/01 15:23

Conventional Chemistry Parameters per APHA/EPA Methods

Project Manager: Guy Tanz

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-011001-106 (P1J0097-01) Water					Sampled: 10/0	1/01 Rece	ived: 10/02/	01	
Total Suspended Solids	ND	20.0	mg/l	l	EPA 160.2	10/05/01	10/09/01	1100243	
5106-011001-107 (P1J0097-02) Water					Sampled: 10/0	1/01 Rece	ived: 10/02/	01	
Total Suspended Solids	55.0	50.0	mg/l	i	EPA 160.2	10/05/01	10/09/01	1100243	
5106-011001-108 (P1J0097-03) Water					Sampled: 10/0	1/01 Rece	ived: 10/02/	01 .	
Total Suspended Solids	36.0	10.0	mg/l	1	EPA 160.2	10/05/01	10/09/01	1100243	
5106-011001-109 (P1J0097-04) Water					Sampled: 10/0	1/01 Rece	ived: 10/02/	01	
Total Suspended Solids	35.0	10.0	mg/l	1	EPA 160.2	10/05/01	10/09/01	1100243	

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Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776 509.924.9200 fax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.905.9200 fax 503.906.9210

Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588

Hahn and Associates, Inc.

434 NW Sixth Ave., Suite 203 Portland, OR 97209

Project Number: 5106-011001 Project Manager: Guy Tanz

Project: T1 South

Reported: 10/17/01 15:23

Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method = Quality Control

	No	rth Creek	Analyt	ical - Pe	ortland					
Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1100139 - EPA 3510 Fuels	-·									
Blank (1100139-BLK1)				Ргераге	d & Analy	zed: 10/0	3/01			
Diesel Range Organics	ND	0.250	mg/l							
Heavy Oil Range Hydrocarbons	ND	0.500	11							
Surr: 1-Chlorooctadecane	0.0851		н	0.0960		88.6	50-150		•	
LCS (1100139-BS1)				Prepare	d & Analy	zed: 10/0	3/01			
Diesel Range Organics	2.51	0.250	mg/l	2.58		97.3	50-150			
Heavy Oil Range Hydrocarbons	1.65	0.500		1.58		104	50-150			
Surr: 1-Chlorooctadecane	0.0923	· · · · · · · · · · · · · · · · · · ·	п	0.0960		96.1	50-150			
LCS Dup (1100139-BSD1)				Prepare	d & Analy	zed: 10/0	3/01			
Diesel Range Organics	2.49	0.250	mg/l	2.58		96.5	50-150	0.800	50	
Heavy Oil Range Hydrocarbons	1.69	0.500	**	1.58		107	50-150	2.40	50	
Surr: 1-Chlorooctadecane	0.0911			0.0960		94.9	50-150			

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Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503,906,9200 fax 503,906,9210

Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541,383,9310 fax 541,382,7588

Hahn and Associates, Inc.

434 NW Sixth Ave., Suite 203

Portland, OR 97209

Project: T1 South

Project Number: 5106-011001 Project Manager: Guy Tanz

Reported: 10/17/01 15:23

Total Metals per EPA 6000/7000 Series Methods Quality Control

North Creek Analytical - Portland										
Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1100451 - EPA 200/3005										
Blank (1100451-BLK1)				Prepare	d: 10/10/0	1 Analyz	ed: 10/11/0)i		
Arsenic	ND	0.00100	mg/l					~		_
Cadmium	ND	0.00100								
Chromium	ND	0.00100	•							
Соррег	ND	0.00200	4							
Lead	ND	0.00100	*1							
Nickel	ND	0.00200	11							
Silver	ND	0.00100	**							
Zine	ND	0.00500	•							
LCS (1100451-BS1)				Ргераге	d: 10/10/0	l Analyz	ed: 10/11/0	10		
Arsenic	0.104	0.00100	mg/l	0.100		104	80-120			
Cadmium	0.104	0.00100	•	001.0		104	80-120			
Chromium	0.103	0.00100	11	0.100		103	80-120			
Copper	0.103	0.00200	"	0.100		103	80-120			
Lead	0.104	0.00100	**	0.100		104	80-120			
Nickel	0.102	0.00200	u	0.100		102	80-120			
Silver	0.0497	0.00100	n	0.0500		99.4	80-120			
Zine	0.106	0.00500	•	0.100		106	80-120			
Duplicate (1100451-DUP1)	Soi	arce: P1J009	7-03	Prepare	d: 10/10/0	l Analyz	ed: 10/11/0	01		_
Arsenic	0.00222	0.00100	mg/l		0.00201			9.93	20	
Cadmium	ND	0.00100	n		ND				20	
Chromium	0.00294	0.00100	n		0.00325			10.0	20	
Copper	0.00415	0.00200	"		0.00474			13.3	20	
Lead	0.00102	0.00100	•		0.00116			12.8	20	
Nickel	0.00502	0.00200	#		0.00525			4.48	20	
Silver	ИD	0.00100	*		ND				20	
Zinc	0.00914	0.00500	n		0.0106			14.8	20	

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Seante 11720 North Creek Pkwy N, Suite 409, Bothell, WA 98011-8244 425,420.9200 fax 425,420.9210

Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776 509.924.9200 fax 509.924.9299 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.905.9200 fax 503.906.9210

Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588

Hahn and Associates, Inc.

Project: T1 South

434 NW Sixth Ave., Suite 203 Portland, OR 97209

Project Number: 5106-011001 Project Manager: Guy Tanz

Reported: 10/17/01 15:23

0.00486

0.000200

mg/l

0.00500

Total Metals per EPA 6000/7000 Series Methods - Quality Control

	Nor	th Creek	Analyt	ical - Po	ortland					
Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1100451 - EPA 200/3005			_		 					
Matrix Spike (1100451-MS1)	Sou	rce: P1J009	7-03	Ргераге	d: 10/10/0	i Analyz	ed: 10/11/0	1		
Arsenic	0.0929	0.00870	mg/l	0.100	ND	90.9	75-125		-	
Cadmium	0.0931	0.00870	•	0.100	ND	93.0	75-125			
Chromium	0.112	0.00100	Ħ	0.100	0.00325	109	75-125			
Copper	0.111	0.00200	11	0.100	0.00474	106	75-125			
Lead	0.109	0.00100	r	0.100	0.00116	108	75-125			
Nickel	0.109	0.00200	b	0.100	0.00525	104	75-125			
Silver	0.0519	0.00100	n	0.0500	ND	103	75-125			
Zinc	0.116	0.00500	n	0.100	0.0106	105	75-125			
Matrix Spike (1100451-MS2)	. Soi	ırce: P1J00 9	7-04	Prepare	d: 10/10/0	l Analyz	ed: 10/11/0)1		
Arsenic	0.104	0.00100	mg/l	0.100	0.00106	103	75-125			
Cadmium	. 0.102	0.00100	-	0.100	ND	102	75-125			
Chromium	0.102	0.00100		0.100	0.00265	99.4	75-125			
Copper	0.103	0.00200	es	0.100	0.00388	97.1	75-125			
Lead	0.0995	0.00100		0.100	ND	98.5	75-125			
Nickel	0.101	0.00200		0.100	0.00449	96.5	75-125			
Silver	0.0480	0.00100	**	0.0500	ND	95.6	75-125			
Zinc	0.106	0.00500	"	0.100	0.00843	97.6	75-125			
Batch 1100490 - EPA 7470										
Blank (1100490-BLK1)				Prepare	ed: 10/11/0	I Analyz	ed: 10/12/	01		
Mercury	ND	0.000200	mg/l							
LCS (1100490-BS1)				Prepare	ed: 10/11/0)i Analyz	ed: 10/12/	01		

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97.2

80-120

Mercury

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425.420.9200 fax.425.420.9210 East 11115 Montgomery, Suite B. Spokane, WA 99205-4776 509.924.9200 fax.509.924.9290 Spokane

9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906.9200 (ax 503.906.9210 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711

541.383.9310 fax 541.382.7588

Hahn and Associates, Inc. 434 NW Sixth Ave., Suite 203 Project: T1 South

Project Number: 5106-011001

Reported:

Portland, OR 97209

Project Manager: Guy Tanz 10/17/01 15:23

Total Metals per EPA 6000/7000 Series Methods - Quality Control

North	Creek	Anal	vtical -	Portland
IVVICE	CICCA	AHAI	TUCAL -	1 VI WANU

		Reporting		Spike	Source		%REC		RPD	
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 1100490 - EPA 7470

Duplicate (1100490-DUP1)	Sou	rce: P1J009	8-04	Prepared	: 10/11/0	I Analyz	zed: 10/12/01	
Mercury	ND	0.000200	mg/l		ND			20
Matrix Spike (1100490-MS1)	Sou	rce: P1J009	8-04	Prepared	: 10/11/0	1 Analyz	zed: 10/12/01	
Mercury	0.00487	0.000200	mg/J	0.00500	ND	97.4	75-125	

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| Spokane | 11720 North Creek Pkwy N, Suite 400, Bothell, WA 98011-8244 | 425.420.9200 | fax 425.420.9210 | East 11115 Montgomery, Suite B, Spokane, WA 99206-4776

509.924.9200 fax 509.924.9230

Portland 9405 SW Nimbus Avenue, Βεανεποπ, OR 97008-7132
503.906.9200 fax 503.906.9210

20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711

541.383.9310 fax 541.382.7588

Hahn and Associates, Inc. 434 NW Sixth Avc., Suite 203 Portland, OR 97209

Project: T1 South Project Number: 5106-011001 Project Manager: Guy Tanz

Reported: 10/17/01 15:23

Dissolved Metals per EPA 6000/7000 Series Methods - Quality Control

	No	rth Creek	Analyt	ical - Po	ortland				•	
		Reporting		Spike	Source		%REC	•	RPD	1
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 1100551 - EPA 200/3005 Diss										
Blank (1100551-BLK1)				Ргераге	d: 10/12/0	l Analyz	ed: 10/16/0)1		
Arsenic	ND	0.00819	mg/l							
Copper	ND	0.00200	Ħ							
Lead	ND	0.00100	н							
LCS (1100551-BS1)				Ргераге	d: 10/12/0	1 Analyz	ed: 10/16/0) ł		
Arsenic	0.102	0.00100	mg/l	0.100		102	80-120			
Соррет	0.102	0.00200	"	0.100		102	80-120			
Lead	0.101	0.00100	**	0.100		101	80-120			
Duplicate (1100551-DUP1)	So	urce: P1J009	7-01	Prepare	d: 10/12/0	I Analyz	ed: 10/16/0	01		Q-06
Arsenic	ND	0.00100	mg/l		ND			92.1	20	
Copper	ND	0.00200			ND			40.0	20	Q-06
Lead	ND	0.00100	4		ND			137	20	Q-06
Matrix Spike (1100551-MS1)	So	urce: P1J009	7-01	Prepare	d: 10/12/0) 1 Analyz	ed: 10/16/	10		
Arsenic	0.102	0.00100	mg/l	0.100	ND	102	75-125			
Copper	0.0995	0.00200	*	0.100	ND	98.8	75-125			
Lead	0.0978	0.00100	#	0.100	ND	97.6	75-125			
Matrix Spike (1100551-MS2)	Source: P1J0192-01		Ргераге	d: 10/12/0) 1 Analyz	ed: 10/16/	01			
Arsenic	0.102	0.00100	mg/l	0.100	ND	102	75-125			
Copper	0.100	0.00200	"	0.100	ND	99.3	75-125			
Lead	0.0957	0.00100	49	0.100	ND	95.6	75-125			

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909.924.9200 18x 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906.9200 18x 503.906.9210

Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588

Hahn and Associates, Inc. 434 NW Sixth Ave., Suite 203

Portland, OR 97209

Project: T1 South

Project Number: 5106-011001 Project Manager: Guy Tanz

Reported: 10/17/01 15:23

Volatile Organic Compounds per EPA Method 8260B - Quality Control

North	Crock	Analytical	l - Portland
1 3 4 7 1 1 1 1 1	I . I C.C.N.	AHAIVIRIA	1 - 1 ()) (14)

1											ı
		Reporting		Spike	Source		%REC		RPD	'	
	Analyte Resul	t Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes	l

Datab	11001	190 - E1	DA.	CASAD
Katch	11111111	1947 - P.I	PA '	50 4DK

1	Batch 1100190 - EPA 5030B				
Ì	Blank (1100190-BLK1)				Prepared & Analyzed: 10/04/01
	Acetone	ND	25.0	ug/l	
1	Benzene	ND	1.00	n	
i	Bromobenzene	ND	1.00	11	
,	Bromochloromethane	ND	1.00	n	
į	Bromodichloromethane	ND	1.00	n	
1	Bromoform	ND	1.00	bt	
j	Bromomethane	ND	5.00	**	
	2-Butanone	ND	10.0.	•	
}	n-Butylbenzene	ND	5.00	4	
i	sec-Butylbenzene	ИD	1.00	17	
	tert-Butylbenzene	ND	1.00	т.	
ļ	Carbon disulfide	ND	10.0	т.	
į	Carbon tetrachloride	ND	1.00	• .	
•	Chlorobenzene	ИD	1.00	n	
į	Chloroethane	ND	1.00	n	
;	Chloroform	ND	1.00	n	
ì	Chloromethane	ND	5.00	•	
	2-Chlorotoluene	ND	1.00		
:	4-Chlorotolucne	ND	1.00	π	
:	1,2-Dibromo-3-chloropropane	ND	5.00	n	
	Dibromochloromethane	ND	1.00	11	
•	1,2-Dibromoethane	ND	1.00	"	
	Dibromomethane	ND	1.00	**	
•	1,2-Dichlorobenzene	ND	1.00	"	
,	1,3-Dichlorobenzene	ND	1.00	u	
	1,4-Dichlorobenzene	ND	1.00		
•	Dichlorodifluoromethane	ND	5.00	"	•
	1,1-Dichloroethane	ND	1.00	•	
	1,2-Dichloroethane	ND	1.00	•	
:	1,1-Dichloroethene	ND	1.00		
	cis-1,2-Dichloroethene	ND	1.00		
٠	trans-1,2-Dichloroethene	ND	1.00		
:	1,2-Dichloropropane	ND	1.00		
•	1,3-Dichloropropane .	ND	1.00	"	
	2,2-Dichloropropane	ND	1.00	n n	
	1,1-Dichloropropene	ND	00.1		

North Creek Analytical - Portland

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Lisa Domenighini, Project Manager

North Creek Analytical, Inc. **Environmental Laboratory Network**



Seattle 11720 North Creek Pkwy PJ, Suite 400, Bothell, WA 98011-8244 425.420.9200 fax 425.420.9210 Spokane East 11115 Montgomery, Suite B, Spekane, WA 99205-4776 509.924.9200 fax 509.924.9290 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906.9209 fax 503.906.9210

Portland

20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588

Hahn and Associates, Inc.

434 NW Sixth Ave., Suite 203

Portland, OR 97209

Project: T1 South

Project Number: 5106-011001

Project Manager: Guy Tanz

Reported:

10/17/01 15:23

Volatile Organic Compounds per EPA Method 8260B - Quality Control

North	Creel	c Anal	lvtical	l - P	ort	land	
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									•		-
	<u> </u>		Reporting		Spike	Source		%REC	-	RPD	İ
1	Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch	1100190	- EPA	5030B

Batch 1100190 - EPA 5030B							
Biank (1100190-BLK1)				Prepared & A	Analyzed: 10/0	1/01	
cis-1,3-Dichloropropene	ND	1.00	ո8/յ				
trans-1,3-Dichloropropene	ND	1.00	n				
Ethylbenzene	ND	1.00	**				
Hexachlorobutadiene	ND	2.00					
, 2-Hexanone	ND	10.0	11				
lsopropylbenzene	ND	2.00	n				
j p-lsopropyltoluene	ND	2.00	н				
4-Methyl-2-pentanone	ND	5.00	•				
Methyl tert-butyl ether	ND	1.00	-				
Methylene chloride	ND	5.00	71				
Naphthalene	ND	2.00	n				
n-Propylbenzene	ND	1.00	**				
Styrene	ND	1.00	н				
1,1,1,2-Tetrachloroethane	ND	1.00	n				
1,1,2,2-Tetrachloroethane	ND	1.00	**				
Tetrachloroethene	ND	1.00	4				
: Toluene	ND	1.00	-				
1,2,3-Trichlorobenzene	ND	1.00	n				
1,2,4-Trichlorobenzene	ND	1.00					
1,1,1-Trichloroethane	ИD	1.00	17				
1,1,2-Trichloroethane	ND	1.00					
: Trichloroethenc	ND	1.00	**				
Trichlorofluoromethane	ND	1.00	"				
1,2,3-Trichloropropane	ND	1.00	11				
, 1,2,4-Trimethylbenzene	ND	1.00	-				
1,3,5-Trimethylbenzene	ND	1.00	н				
/ Vinyl chloride	ND	1.00	11				
o-Xylene	ND	1.00	"				
m,p-Xylene	ND	2.00	"				
Surr: 4-BFB	21.6		#	20.0	108	75-125	
Surr: 1,2-DCA-d4	21.6			20.0	108	75-125	
Surr: Dibromofluoromethane	20.2		•	20.0	101	75-125	
Surr: Toluene-d8	20.4		•	20.0	102	75-125	

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Lisa Domenighini, Project Manager

North Creek Analytical, Inc. **Environmental Laboratory Network**



| Seattle | 11720 North Creek Pkwy N, Suite 400, Bothell, WA 58011-8244 | 425,420,9200 | Tax 425,420,9210 | East 11115 Montgomery, Suite B, Spokane, WA 99206-4776 | 509,924,9200 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,9290 | Tax 509,924,925,920 | Tax 509,924,925,925

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503-906-9200 Fax 503-906-9210

Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541,383.9310 fax 541,382,7588

Hahn and Associates, Inc. 434 NW Sixth Ave., Suite 203

Portland, OR 97209

Project: T1 South

Project Number: 5106-011001 Project Manager: Guy Tanz

Reported: 10/17/01 15:23

Volatile Organic Compounds per EPA Method 8260B Quality Control

		Reporting		Spike	Source		%REC		RPD	
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 1100190 - EPA 5030B										
LCS (1100190-BS1)				Prepare	d & Analy	zed: 10/0-	4/01			
Benzene	20.4	1.00	ug/l	20.0		102	80-125			
Chlorobenzene	23.6	1.00	11	20.0		118	80-125			
1,1-Dichloroethene	19.6	1.00	a	20.0		98.0	70-135			
Tolucne	21.8	1.00	ч	20.0		109	80-125			
Trichloroethene	19.2	1.00	•	20.0		96.0	70-130			
Surr: 4-BFB	23.0		•	20.0		115	75-125			·
Surr: 1,2-DCA-d4	21.6		•	20.0		108	75-125			
Surr: Dibromofluoromethane	19.7		"	20.0		98.5	75-125			
Surr: Toluene-d8	20.9		"	20.0		104	75-125			
Matrix Spike (1100190-MS1)	So	urce: P1J005	57-04	Prepare	d & Analy	zed: 10/0	4/01			
Benzene	19.8	1.00	ug/l	20.0	ND	97.7	80-125			
Chlorobenzene	22.3	1.00	ħ	20.0	ND	112	80-125			
1,1-Dichloroethene	20.0	1.00	Ħ	20.0	ND	100	70-135			
Toluene	21.3	1.00	Ħ	20.0	ND	106	80-125			
Trichloroethene	18.4	1.00	-	20.0	ND	89.0	70-130			
Surr: 4-BFB	22.5		a	20.0		112	75-125	•••		
Surr: 1,2-DCA-d4	20.7		•	20.0		104	75-125			
Surr: Dibromofluoromethane	20.8		~	20.0		104	75-125			
Surr: Toluene-d8	20.9		,,	20.0		. 104	75-125			
Matrix Spike Dup (1100190-MSD1)	So	urce: P1J005	57-04	Prepare	d & Analy	/zed: 10/0	4/01			
Benzene	20.0	1.00	ug/l	20.0	ND	98.7	80-125	1.01	25	
Chlorobenzene	22.1	1.00	*	20.0	ND	110	80-125	0.901	25	
1,1-Dichloroethene	19.6	1.00		20.0	ND	98.0	70-135	2.02	25	
Toluene	21.0	1.00		20.0	ND	105	80-125	1.42	25	
Trichloroethene	18.5	1.00	*	20.0	ND	89.4	70-130	0.542	25	
Surr: 4-BFB	22.4		п	20.0		112	75-125			
Surr: 1,2-DCA-d4	21.0		**	20.0		105	75-125			
Surr: Dibromofluoromethune	20.5		#	20.0		102	75-125			
0 00 10			_							

20.0

20.8

North Creek Analytical - Portland

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75-125



Surr: Toluene-d8

Lisa Domenighini, Project Manager

North Creek Analytical, Inc. **Environmental Laboratory Network**



Seattle 11720 North Creek Pkwy N, Suite 400, Bothell, WA 98011-8244 425,420,9200 fax 425,420,9210 Fast 11115 Muntgomery, Suite B, Spokane, WA 99206-4776 509,924,9200 fax 509,924,9290

Suokane

509-924-9200 Fax 509-924-9250 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906-9200 Fax 503.906-9210 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 Fax 541.382,7588

Hahn and Associates, Inc. 434 NW Sixth Ave., Suite 203

Portland, OR 97209

Project: TI South

Project Number: 5106-011001 Project Manager: Guy Tanz

Reported: 10/17/01 15:23

Semivolatile Organic Compounds per EPA Method 8270C - Quality Control

North	Creek	Ana	lvtical	- Portland	ł

								_		
• *		Reporting		Spike	Source		%REC		RPD	
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

2-Chloropaphthalene ND 5.00 " 2-Chlorophenol ND 5.00 " 4-Chlorophenyl phenyl ether ND 5.00 " Chrysene ND 5.00 " Di-n-butyl phthalate ND 5.00 " Di-n-octyl phthalate ND 5.00 " Dibenzo (a,h) anthracene ND 5.00 " Dibenzofuran ND 5.00 " 1,2-Dichlorobenzene ND 5.00 " 1,3-Dichlorobenzene ND 5.00 " 1,4-Dichlorobenzene ND 5.00 " 3,3'-Dichlorobenzidine ND 5.00 " 2,4-Dichlorophenol ND 5.00 " Diethyl phthalate ND 5.00 " 2,4-Dimitro-2-methylphenol ND 10.0 " 4,6-Dinitro-2-methylphenol ND 25.0 "	Batch 1100188 - EPA 3510/600 Se	ries			
Acenaphthylene ND 5.00 up/ Acenaphtylene ND 5.00 " Anthracene ND 5.00 " Benzo (a) pyrene ND 5.00 " Benzo (b) flooranthene ND 5.00 " Benzo (a) flooranthene ND 5.00 " Benzo (b) flooranthene ND 5.00 " Benzo (a) flooranthene ND 5.00 " Benzo (b) flooranthene ND 5.00 " Chorthous (b) flooranthene ND 5.00 " Buyl tenzyl phthalate ND 5.00 " Bisi(2-chloro	Blank (1100188-BLK1)				Prepared: 10/04/01 Analyzed: 10/10/01
Renzo (a) andmeene		ND	5.00	ug/l	
Benzo (a) anthmene	Acenaphthylene	ND	5.00	H	
Benzo (a) principle (b) 100 pr	Anthracene	ND	5.00	**	
Serzo (b) fluoranthene ND 5.00 ** Benzo (g (bi) perylene ND 5.00 ** Benzo (g (bi) perylene ND 5.00 ** Benzo (g (b) fluoranthene ND 5.00 ** Benzo (a (b) fluoranthene ND 5.00 ** Benzyl alcohol ND 10.0 ** 4-Bromophenyl phenyl ether ND 5.00 ** Buyl benzyl phthalate ND 5.00 ** 4-Chloro-3-methylphenol ND 5.00 ** 4-Chloro-3-methylphenol ND 5.00 ** 4-Chloro-3-methylphenol ND 5.00 ** Bis(2-chlorothyymchane ND 10.0 ** Bis(2-chlorothyymchane ND 10.0 ** Bis(2-chlorothyymchane ND 5.00 ** Bis(2-chlorothyphether ND 5.00 ** Bis(2-chlorothyphether ND 5.00 ** Chloronaphhalane ND 5.00 ** 2-Chloronaphhalane ND 5.00 ** 2-Chlorophenyl phenyl ether ND 5.00 ** 3-Chlorophenyl phenyl ether ND 5.00 ** Di-n-botyl phhalate ND 5.00 ** Di-n-botyl phhalate ND 5.00 ** Di-n-botyl phhalate ND 5.00 ** Di-n-botyl phhalate ND 5.00 ** 1,2-Dichlorobenzene ND 5.00 ** 1,3-Dichlorobenzene ND 5.00 ** 1,3-Dichlorobenzene ND 5.00 ** 1,4-Dichlorobenzene ND 5.0	Benzo (a) anthracene	ND	5.00	n	
Benzo (ghi) perylene	Benzo (a) pyrene	ND	5.00	ti	
Benzo (k) fluoranthene ND 5.00 **	Benzo (b) fluoranthene	ND	5.00	•	·
Benzoic Acid ND 50.0 ** Benzyi alcohol ND 10.0 ** 4-Bromophenyl phenyl ether ND 5.00 ** Buyl benzyl phthalate ND 5.00 ** 4-Chloro-3-methylphenol ND 5.00 ** 4-Chlorosaniline ND 20.0 ** Bis(2-chlorotehyy)methane ND 10.0 ** Bis(2-chlorotehyy)ether ND 5.00 ** Bis(2-chlorotehyy)ether ND 5.00 ** Bis(2-chlorophy)ether ND 5.00 ** Bis(2-chlorophy)ether ND 5.00 ** Bis(2-chlorophy)ether ND 5.00 ** 2-Chlorophenol ND 5.00 ** 4-Chlorophenol ND 5.00 ** 4-Chlorophenol ND 5.00 ** 1-Din-buyl phthalate ND 5.00 ** Din-buyl phthalate ND 5.00 ** Dibenzo (a,h) anthracene ND 5.00 ** Dibenzo (arange ND 5.00 ** 1,2-Dichlorobenzene ND 5.00 ** 1,3-Dichlorobenzene ND 5.00 ** 1,4-Dichlorobenzene ND 5.00 ** 1,4-Dichlorobenzene ND 5.00 ** 1,4-Dichlorobenzene ND 5.00 ** 2,4-Dinitro-2-methylphenol ND 5.00 ** 2,4-Dinitro-2-methylphenol ND 5.00 ** 1,6-Dinitro-2-methylphenol ND 5.00 ** 1,4-Dinitro-2-methylphenol ND 5.00 **	Benzo (ghi) perylene	ND	5.00	-	
Benzyl alcohol	Benzo (k) fluoranthene	ND	5.00	-	
Buryl benzyl phthalate	Benzoic Acid	ND	50.0	•	
Butyl benzyl phthalate	Benzył alcohol	ND	10.0	11	
4-Chloro-3-methylphenol ND 5.00 - 4-Chloroaniline ND 20.0 - Bis(2-chloroethoxy)methane ND 10.0 - Bis(2-chloroethoxy)ether ND 5.00 - 2-Chloroaphthalene ND 5.00 - 2-Chlorophenol ND 5.00 - 4-Chlorophenol ND 5.00 - 4-Chlorophenyl phenyl ether ND 5.00 - 1-Chrysene ND 5.00 - Din-butyl phthalate ND 5.00 - Dibenzo (a,b) anthracene ND 5.00 - Dibenzo (u,b) anthracene ND 5.00 - 1,3-Dichlorobenzene ND 5.00 - 1,3-Dichlorobenzene ND 5.00 - 1,4-Dichlorobenzene ND 5.00 - 1,4-Dichlorobenzene ND 5.00 - 2,4-Dimethyl phthalate ND 5.00 - 2,4-Dimethyl phthalate ND 5.00 - 2,4-Dimethyl phthalate ND 5.00 - 2,4-Dimethyl phthalate ND 5.00 - 3,3-Cochlorobenzene ND 5.00 - 2,4-Dimethyl phthalate ND 5.00 - 3,4-Dimethyl phthalate ND 5.00 - 3,4-Dimitro-2-methylphenol ND 10.0 - 3,4-Dimitro-2-methylphenol ND 10.0 - 3,4-Dimitro-2-methylphenol ND 10.0 - 3,4-Dimitro-2-methylphenol ND 10.0 - 3,4-Dimitro-2-methylphenol ND 10.0 - 3,4-Dimitrophenol ND 10.0	4-Bromophenyl phenyl ether	ND	5.00	u	
4-Chloroaniline ND 20.0 Bis(2-chlorothoxy)methane ND 10.0 Bis(2-chlorothyt)ether ND 5.00 Bis(2-chlorospropylether ND 5.00 2-Chloronaphthaleme ND 5.00 2-Chlorophenol ND 5.00 4-Chlorophenyl phenyl ether ND 5.00 Chrysene ND 5.00 Din-butyl phthalate ND 5.00 Di-n-octyl phthalate ND 5.00 Dibenzo (a,b) anthracene ND 5.00 Dibenzo (aran ND 5.00 1,3-Dichlorobenzene ND 5.00 1,3-Dichlorobenzene ND 5.00 3,3'-Dichlorobenzidine ND 5.00 3,3'-Dichlorobenzidine ND 5.00 2,4-Dimethyl phthalate ND 5.00 4,6-Dinitro-2-methylphenol ND 10.0 1,4-Dinitrophenol ND 10.0 2,4-Dinitrophenol ND 5.00	Butyl benzyl phthalate	ND	5.00	n	
Bis(2-chloroethoxy)methane	4-Chloro-3-methylphenol	ND	5.00	•	
Bis(2-chlorospropyl)ether	4-Chloroaniline	ND	20.0		
Bis(2-chloroisopropyl)ether	Bis(2-chloroethoxy)methane	ND	10.0	-	
2-Chloropaphthalene ND 5.00 " 2-Chlorophenol ND 5.00 " 4-Chlorophenyl phenyl ether ND 5.00 " Chrysene ND 5.00 " Di-n-butyl phthalate ND 5.00 " Di-n-octyl phthalate ND 5.00 " Dibenzo (a,h) anthracene ND 5.00 " Dibenzofuran ND 5.00 " 1,2-Dichlorobenzene ND 5.00 " 1,3-Dichlorobenzene ND 5.00 " 1,4-Dichlorobenzene ND 5.00 " 3,3'-Dichlorobenzidine ND 5.00 " 2,4-Dichlorophenol ND 5.00 " Diethyl phthalate ND 5.00 " 2,4-Dimitro-2-methylphenol ND 10.0 " 4,6-Dinitro-2-methylphenol ND 25.0 "	Bis(2-chloroethyl)ether	ND	5.00		
2-Chlorophenol	Bis(2-chloroisopropyl)ether	ND	10.0	LF	
4-Chlorophenyl phenyl ether	2-Chloronaphthalene	ND	5.00	rr	
Chrysene ND 5.00 " Di-n-butyl phthalate ND 5.00 " Di-n-octyl phthalate ND 5.00 " Dibenzo (a,h) anthracene ND 5.00 " Dibenzofuran ND 5.00 " 1,2-Dichlorobenzene ND 5.00 " 1,3-Dichlorobenzene ND 5.00 " 1,4-Dichlorobenzene ND 5.00 " 2,4-Dichlorobenzidine ND 5.00 " 2,4-Dichlorophenol ND 5.00 " Diethyl phthalate ND 5.00 " 2,4-Dimethylphenol ND 10.0 " 4,6-Dinitro-2-methylphenol ND 10.0 " 2,4-Dinitrophenol ND 25.0 "	2-Chlorophenol	ND	5.00	•	
Di-n-butyl phthalate	4-Chlorophenyl phenyl ether	ND	5.00	•	
Di-n-octyl phthalate	Chrysene	ND	5.00	n	
Dibenzofuran ND 5.00 " Dibenzofuran ND 5.00 " 1,2-Dichlorobenzene ND 5.00 " 1,3-Dichlorobenzene ND 5.00 " 1,4-Dichlorobenzene ND 5.00 " 2,4-Dichlorobenzidine ND 5.00 " 2,4-Dichlorophenol ND 5.00 " 2,4-Dimethylphenol ND 5.00 " 2,4-Dimethylphenol ND 5.00 " 2,4-Dimethylphenol ND 10.0 " 4,6-Dinitro-2-methylphenol ND 10.0 " 2,4-Dinitrophenol ND 10.0 "	, Di-n-butyl phthalate	ND	5.00	41	
Dibenzofuran ND 5.00 "	Di-n-octyl phthalate	ND	5.00	u	
1,2-Dichlorobenzene	Dibenzo (a,h) anthracene	ND	5.00	17	
1,3-Dichlorobenzene	Dibenzofuran	ND	5.00	**	
1,4-Dichlorobenzene ND 5.00 " 2,3-Dichlorobenzidine ND 5.00 " 2,4-Dichlorophenol ND 5.00 " Diethyl phthalate ND 5.00 " 2,4-Dimethylphenol ND 10.0 " Dimethyl phthalate ND 5.00 " 4,6-Dinitro-2-methylphenol ND 10.0 " 2,4-Dinitrophenol ND 25.0 "	· 1,2-Dichlorobenzene	ND	5.00	4	
3,3'-Dichlorobenzidine	1,3-Dichlorobenzene	ND	5.00	**	
2,4-Dichlorophenol ND 5.00	1,4-Dichlorobenzene	ND	5.00	19	
Diethyl phthalate	3,3'-Dichlorobenzidine	ND	5.00	U	
2,4-Dimethylphenol ND 10.0 " Dimethyl phthalate ND 5.00 " 4,6-Dinitro-2-methylphenol ND 10.0 " 2,4-Dinitrophenol ND 25.0 "	2,4-Dichlorophenol	ND	5.00	u u	
Dimethyl phthalate ND 5.00 " 4,6-Dinitro-2-methylphenol ND 10.0 " 2,4-Dinitrophenol ND 25.0 "	•	ND	5.00	•	
4,6-Dinitro-2-methylphenol ND 10.0 " 2,4-Dinitrophenol ND 25.0 "	2,4-Dimethylphenol	ND	0.01	7	
2,4-Dinitrophenol ND 25.0 "	Dimethyl phthalate	ND	5.00	Ħ	
2,4-Dinitrophenol ND 25.0 "	4,6-Dinitro-2-methylphenol	ND	10.0	*	
2.4-Dinitrotoluene ND 5.00 "		ND	25.0		
- 21 - A contradiction 147 Ann	¹ 2,4-Dinitrotoluene	ND	5.00	n	

North Creek Analytical - Portland

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Lisa Domenighini, Project Manager

North Creek Analytical, Inc. **Environmental Laboratory Network**



Seattle 11720 North Creek Pkwy N, Suite 400, Bothell, WA 98011-8244

425.420.9200 fax 425.420.9210

Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776 509.924.9200 fax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906.9200 fax 503.906.9210

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Hahn and Associates, Inc. 434 NW Sixth Ave., Suite 203 Portland, OR 97209

Project: T1 South

Project Number: 5106-011001 Project Manager: Guy Tanz

Reported: 10/17/01 15:23

Semivolatile Organic Compounds per EPA Method 8270C - Quality Control

North	Creek	Analytica	l - Portland

	Reporting		Spike	Source		%REC		RPD	
Analyte Res	ult Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Ratch 1100189	L FDA	3510/600	Sarios
4521CD (1100)A	1 - F.PA		Series

Batch 1100188 - EPA 3510/600 S	eries						
Blank (1100188-BLK1)				Prepared: 10/6	04/01 Analyze	d: 10/10/01	
2,6-Dinitrotoluene	ND	5.00	ug/i		· · · · · ·		
Bis(2-ethylbexyl)phthalate	ND	10.0	**				
Fluoranthene	ND	5.00	n				
Fluorene	ND	5.00	•				-
Hexachlorobenzene	ND	5.00	-				
Hexachlorobutadiene	ND	10.0	•				
Hexachlorocyclopentadiene	ND	10.0	•				
Hexachloroethane	ND	10.0	11				
Indeno (1,2,3-cd) pyrene	ND	5.00	Ħ				
Isophorone	ND	5.00	n				
2-Methylnaphthalene	ND	5.00	*				
2-Methylphenol	ND	10.0	**				
3-,4-Methylphenol	ND	5.00	•				
Naphthalene	ND	5.00	u				
2-Nitroaniline	ND	5.00	11				
3-Nitroaniline	ND	10.0	n				
4-Nitroaniline	ND	10.0	*				
Nitrobenzene	ND	5.00	•				
2-Nitrophenol	ND	5.00	•				
4-Nitrophenol	ND	25.0	11				
N-Nitrosodi-n-propylamine	ND	10.0	ŧŧ				
N-Nitrosodiphenylamine	ND	5.00	н				
Pentachlorophenol	ND	10.0					
Phenanthrene	ND	5.00	н				
Phenol	ИD	5.00					
Pyrene	ND	5.00	n				
1,2,4-Trichlorobenzene	ND	5.00	"				
2,4,5-Trichlorophenol	ND	5.00	н				
2,4,6-Trichlorophenol	ND	5.00		•			
Surr: 2-Fluorobiphenyl	21.0		~	75.0	28.0	26-135	
Surr: 2-Fluorophenol	60.1		σ.	150	40.1	6-124	
Surr: Nitrobenzene-d5	35.7		"	75.0	47.6	23-147	
Surr: Phenol-d6	38.0		n	150	25.3	11-130	
Surr: p-Terphenyl-d14	51.7			75.0	68.9	38-149	
Surr: 2,4,6-Tribromophenol	138		#	150	92.0	19-126	

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Lisa Domenighini, Project Manager

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Seattle 11720 North Creek Pkwy N, Suite 400, Bothell, WA 98011-B244 425,420,9200 fax 425,420,9210 East 11115 Montgomery, Suite B, Spokane, WA 99205-4776 509,924,9200 fax 509,924,9290 905 SW Nimbus Avenue, Beaverton, OR 97008-7132 503,905,9200 fax 503,906,9210 Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541,383,9310 fax 541,382,7588

Hahn and Associates, Inc. 434 NW Sixth Ave., Suite 203 Portland, OR 97209

Project: T1 South

Project Number: 5106-011001 Project Manager: Guy Tanz

Reported: 10/17/01 15:23

Semivolatile Organic Compounds per EPA Method 8270C - Quality Control

North	Crook	Analytical	l - Portland
NOTIO	ч.геек	Апатупса	i - roruana

		Reporting		Spike	Source		%REC		RPD	
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

LCS (1100188-BS1)				Prepared: 10	/04/01 Analyz	ed: 10/11/0	1	
Acenaphthene	53.6	5.00	ug/l	75.0	71.5	40-110		
4-Chloro-3-methylphenol	147	5.00	n	150	98.0	40-110		
2-Chlorophenol	137	5.00	17	150	91.3	40-110		•
1,4-Dichlorobenzene	20.6	5.00	H	75.0	27.5	20-90		
2,4-Dinitrotoluene	82.6	5.00	11	75.0	110	50-110		
4-Nitrophenol	58.4	25.0	10	150	38.9	15-100		
N-Nitrosodi-n-propylamine	56.8	10.0	U	75.0	75.7	40-110		
Pentachlorophenol	149	10.0		150	99.3	30-120		
Phenol	45.6	5.00	-	150	. 30.4	15-110		
Рутеве	77.6	5.00	-	75.0	103	40-110		
1,2,4-Trichlorobenzene	22.2	5.00		75.0	29.6	25-100		
Surr: 2-Fluorobiphenyl	31.6		"	75.0	42.1	26-135		
Surr: 2-Fluorophenol	77.5		~	150	51.7	6-124		
Surr: Nitrobenzene-d5	63.1		~	75.0	84.1	23-147		
Surr: Phenol-d6	47.7		67	150	31.8	11-130		
Surr: p-Terphenyl-d14	86.3		ų	75.0	115	38-149		
Surr: 2,4,6-Tribromophenol	188		*	150	125	19-126		
LCS Dup (1100188-BSD1)				Prepared: 10)/04/01 Analyz	æd: 10/10/0)1	
Acenaphthene	46.2	5.00	ug/l	75.0	61.6	40-110	14.8	36
4-Chloro-3-methylphenol	113	5.00	•	150	75.3	40-110	26.2	43
2-Chlorophenol	103	5.00	•	150	68.7	40-110	28.3	38
1,4-Dichlorobenzene	21.7	5.00	٠	75.0	28.9	20-90	5.20	43
2,4-Dinitrotoluene	64.7	5.00	11	75.0	86.3	50-110	24.3	31
4-Nitrophenol	47.3	25.0	H	150	31.5	15-100	21.0	_. 36
N-Nitrosodi-n-propylamine	49.9	10.0	Ħ	75.0	66.5	40-110	12.9	37
Pentachlorophenol	124	10.0		150	82.7	30-120	18.3	40
Phenol	35.0	5.00	11	150	23.3	15-110	26.3	36
Pyrene	66.4	5.00	11	75.0	88:5	40-110	15.6	31
1,2,4-Trichlorobenzene	25.0	5.00	41	75.0	33.3	25-100	11.9	42
Surr: 2-Fluorobiphenyl	26.7		"	75.0	35.6	26-135		
Surr: 2-Fluorophenol	56.5		•	150	37.7	6-124		
Surr: Nitrobenzene-d5	53.0			75.0	70.7	23-147		
Surr: Phenol-d6	36.4		я	150	24.3	11-130		
Surr: p-Terphenyl-d14	73.2		•	75.0	97.6	38-149		
Surr: 2,4,6-Tribromophenol	143		"	150	95.3	19-126		

North Creek Analytical - Portland

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Lisa Domenighini, Project Manager

North Creek Analytical, Inc. **Environmental Laboratory Network**



Seattle 11720 North Creek Pkwy N, Suite 400, Bothell, WA 98011-8244 425.420.9200 fax 425.420.9210

425.4(1.92(0) 13x 325.4(1.92(1)

Spokane East 11115 Montgomery, Suite B, Spokane, WA 99205-4776

509.924.9200 1ax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132

503.906.9200 1ax 503.906.9210

Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383 9310 fax 541.382,7588

Hahn and Associates, Inc. 434 NW Sixth Ave., Suite 203 Portland, OR 97209

Project: T1 South

Project Number: 5106-011001 Project Manager: Guy Tanz

Reported: 10/17/01 15:23

Semivolatile Organic Compounds per EPA Method 82700 - Quality Control

North Creek Analytical - Portland

	1	Reporting		Spike	Source		%REC	-	· RPD	
Analyte	 Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 1100188 - EPA 3510/600 Series

North Creek Analytical - Portland

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Seattle 11720 North Creek Pkwy N, Suite 400, Bothell, WA 98011-8244 425-420.9200 fax 425-420.9210 pokane East 11115 Montgomery, Suite B, Spokane, WA 99205-4776 509.924.9200 fax 509.924.9290

Spokane

9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906.9200 fax 503.906.9210 20332 Empire Avenue, Suite F. I, Bend, OR 97701-5711

541,383.9310 fax 541.382.7588

Hahn and Associates, Inc. 434 NW Sixth Ave., Suite 203 Portland, OR 97209

Project: T! South

Project Number: 5106-011001 Project Manager: Guy Tanz

Reported: 10/17/01 15:23

Polynuclear Aromatic Compounds per EPA 8270M-SIM = Quality Control

North	Creek	Analytical	- Portland

									_		2
]		Reporting		Spike	Source		%REC		RPD		١.
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes	

Batch 11	00208	- EPA	3520/600	Series

Batch 1100208 - EPA 3520/600 Series		_					
Blank (1100208-BLK1)				Prepared: 10	/04/01 Analyze	ed: 10/09/01	
Acenaphthene	ND	0.100	ug/l			•	
Acenaphthylene	ND	0.100	11				
Anthracene	NĐ	0.100	~				
Benzo (a) anthracene	ND	0.100	•				
Benzo (a) pyrene	ND	0.100	-				
Benzo (b) fluoranthene	ND	0.100	-				
Benzo (ghi) perylene	ND	0.100	•				
Benzo (k) fluoranthene	ND	0.100	19				
Chrysene	ND	0.100	77				
Dibenzo (a,h) anthracene	ND	0.200	11				
Fluoranthene	ND	0.100	н				
Fluorene	ND	0.100	ы				
Indeno (1,2,3-ed) pyrene	ND	0.100	**				
Naphthalene	ND	0.100	**				
Phenanthrene	ND	0.100	**				
Pyrene	ND	0.100	н				
Surr: Fluorene-d10	1.43		P	2.50	57.2	25-105	
Surr: Pyrene-d10	1.94		r	2.50	77.6	30-130	
Surr: Benzo (a) pyrene-d12	1.21		r	2.50	48.4	22-120	
LCS (1100208-BS1)				Prepared: 10	/04/01 Analyz	ed: 10/08/01	
. Acenaphthene	1.86	0.100	ug/l	2.50	74.4	26-135	
Benzo (a) pyrene	1.86	0.100	44	2.50	74.4	38-137	
' Рутепе	1.99	0.100	"	2.50	79.6	33-133	
Surr: Fluorene-d10	1.63	-	"	2.50	65.2	25-105	
Surr: Pyrene-d10	2.09		,,	2.50	83.6	30-130	
· Surr: Benzo (a) pyrene-d12	1.38		*	2.50	55.2	22-120	

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isa Domenighini, Project Manager

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Seattle 11720 North Creek Pkwy N, Suite 400, Bothell, WA 98011-8244 425,420,9200 fax 425,420,9210

Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776 509,924,9200 fax 509,924,9290

503.924.9200 1ax 503.924.9290 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906.9200 1ax 503.906.9210 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588

Hahn and Associates, Inc. 434 NW Sixth Ave., Suite 203 Portland, OR 97209

Project: T1 South

Project Number: 5106-011001 Project Manager. Guy Tanz

Reported: 10/17/01 15:23

Polynuclear Aromatic Compounds per EPA 8270M-SIM Quality Control

North	Creek	Analytical	l - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1100208 - EPA 3520/600 Series			,							
LCS Dup (1100208-BSD1)				Ргераге	d: 10/04/0	l Analyz	ed: 10/08/	01		
Acenaphthene	2.31	0.100	ug/l	2.50		92.4	26-135	21.6	60	
Benzo (a) рутеп е	2.17	0.100	19	2.50		86.8	38-137	15.4	60	
Рутепе	2.45	0.100	•	2.50		98.0	33-133	20.7	60	
Surr: Fluorene-d10	1.90	·	tı	2.50		76.0	25-105			
Surr: Pyrene-d10	2.45		**	2.50		98.0	30-130			
Surr: Benzo (a) pyrene-d12	1.52		**	2.50		60.8	22-120			

North Creek Analytical - Portland

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Seattle 11720 North Creek Pkwy N, Suite 460, Bothell, WA 98011-8244 425,420,9200 fax 425,420,9210 Gokane East 11115 Montgomery, Suite B, Spokane, WA 99205-4776 509,924,9200 fax 509,924,9290

9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503,906.9200 fax 503.506.9210 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711

541.383.9310 fax 541.382.7588

Hahn and Associates, Inc. 434 NW Sixth Ave., Suite 203 Portland, OR 97209

Project: T1 South

Project Number: 5106-011001 Project Manager: Guy Tanz

Reported: 10/17/01 15:23

Conventional Chemistry Parameters per APHA/EPA Methods - Quality Control

North Creek Analytical - Portland										
Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1100243 - Wet Chem								·		
Blank (1100243-BLK1)				Prepare	đ: 10/05/0	1 Analyz	ed: 10/09/	01		
Total Suspended Solids	ND	1.00	mg/l				 -			
LCS (1100243-BS1)				Prepare	d: 10/05/0	1 Analyz	ed: 10/09/	01		
Total Suspended Solids	58.0	10.0	mg/l	60.0		96.7	80-120			
Duplicate (1100243-DUP1)	Sou	arce: P1J013	9-02	Prepare	d: 10/05/0) Analyz	ed: 10/09/	01		
Total Suspended Solids	ДИ	10.0	me/l		ND				20	

North Creek Analytical - Portland

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Lisa Domenighini, Project Manager

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Seattle 11720 North Creck Pkwy N, Suite 400, Bothell, WA 98011-8244 425.420.9200 fax 425.420.9210 East 11115 Montgomery, Suite B, Spokane, WA 99206-4776 509.924.9200 fax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906.9200 fax 503.906.9210 Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711

541.383.9310 fax 541.382.7588

Hahn and Associates, Inc. 434 NW Sixth Ave., Suite 203 Portland, OR 97209

Project: T1 South Project Number: 5106-011001 Project Manager: Guy Tanz

Reported: 10/17/01 15:23

Notes and Definitions

A-10	Suspected double spike of surrogate solution during extraction. Actual recoveries believed to be 1/2 of reported values.
D-15	Detected hydrocarbons have non-petroleum peaks or elution pattern that suggests the presence of biogenic interference.
Q-06	Analyses are not controlled on RPD values from sample concentrations less than 5 times the reporting limit.
S-08	Surrogate recovery is above control limits. Since no analytes were detected in the sample, the quality of the data has not been affected.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR .	Not Reported
dry	Sample results reported on a dry weight basis. MRLs are adjusted if %Solids are less than 50%.
wet	Sample results reported on a wet weight basis (as received)
RPD	Relative Percent Difference



North Creek Analytical, Inc. **Environmental Laboratory Network**

APPENDIX F

Supplemental Water Well Survey Research

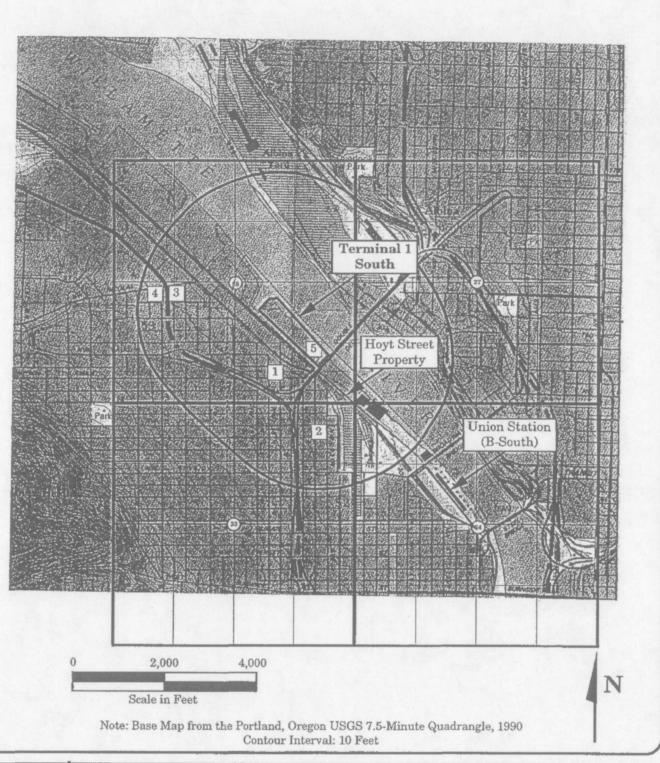
TABLE F1 - Updated Water Well Inventory Summary Table; Township 1N, Range 1E

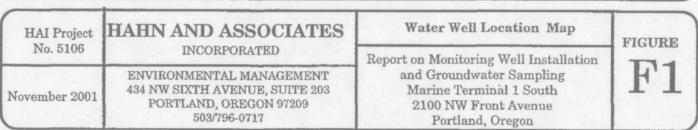
Monitoring Well Installation and Groundwater Sampling Port of Portland Terminal 1 South 2100 NW Front Avenue Portland, Oregon

HAI Project No. 5106

Мар No.	OWRD ID	Section	1/4 Section	1/4 1/4 Section	Original Well Owner	Well Address	Current Contact	Title	Company	Contact Response
1	1015	28	sw	SE	PORTLAND ICE AND COLD STORAGE	1810 NW 18TH	Stuart Lindquist	Facilities Manager	Lindquist Development Company	The well location is unknown and has not been used since at least 1992 when the site was re- developed
2	1014	28	sw	SE	BLITZ WEINHARDT CO.	1991 NW UPSHUR	Bruce Boles	Property Owner	-	The well is covered with wood and has not been in use since he purchased the property
3	1013	28	NW	sw	GRIFFITH RUBBER MILLS	2439 NW 22ND	Ron Burr	Facilities Manager	Griffith Rubber Mills	The well is not being used
4	1011	28	sw	NW	A YOUNG AND SON IRON WORKS	2300 NW NICOLAI ST	Ralph Dwyer	Property Owner		The well was covered with concrete approximately 12 years ago and is not in use
5	1016	28	SE	SE	COMMISSION OF PUBLIC DOCKS	1884 NW FRONT AVE	Joe Mollusky	Properties and Development	Port of Portland	The referenced well has not been identified at the site and is considered to not be in use
6	1044	33	•	•	ICE COLISEUM	Not Known	-	ļ -		No information could be found on this well

Updated: 12/11/01 GHT File: 5106-F1 Well Log Table





Additional Beneficial Use Determination Well Research

Well Number 1:

11/15/01

- > Called Multnomah County Records Office 503-988-3375 (property ownership and taxation department ext. 3)
 - 1810 NW 18th Ave. is address listed on well record.
 - o No such address
 - 1826 NW 18th Ave. is closest match on county records
 - o From aerial (www.mapquest.com) looks like block has only 1 building on it, currently
 - o Warehouse built in 1992
 - o Owner is Lindquist Development Company
 - PO Box 42135, Portland, Oregon, 97242
- > Yellow pages (www.qwestdex.com) found "Lindquist Homes"

2636 NW 26th Ave., Portland, Oregon, 97210

503-227-827

- Answering service said "Lindquist Development Company"
- Asked for facilities manager: Stuart Lindquist
- Left message 11/13/01 & 11/14/01
- Spoke with Stuart at 10:46
 - o He said the address listed for the well location was once an address associated with his property. Also, before he bought the property, one of the buildings on it burned down. He does not know where the well is on the site, and has never used it. He said "it's abandoned".

Well Number 2:

11/12/01

- > -Called Multnomah County Records Office 503-988-3375 (property ownership and taxation department ext. 3)
 - 1991 NWUpshur St. is address listed on well record
 - o Owner is Bruce Boles
 - 2770 SW Patten Lane, Portland, Oregon, 97201
- White pages (www.switchboard.com) found "Boles, Bruce"

2770 SW Patten Lane Portland, Oregon, 97201

503-228-0606

- Spoke with Bruce at 16:16
 - He said the well is covered with wood and has not been in use since he bought the property. He said "it's abandoned".

Well Number 3:

11/01/01

- > -Called Multnomah County Records Office 503-988-3375 (property ownership and taxation department ext. 3)
 - 2439 NW 22nd Ave. is address listed on well record
 - o Owner is Griffith Rubber Mills
 - 2625 NW Industrial St., Portland, Oregon, 97210
- Yellow pages (www.qwestdex.com) found "Griffith Rubber Mills"

2625 NW Industrial St., Portland, Oregon, 97210 503

- 503-226-6971
- Asked for facilities manager: Ron Burr
- Spoke with Ron at 12:00
 - He said the building is gone and no one is using the property. He also said the well is not in use.

Well Number 4:

11/12/01

- > -Called Multnomah County Records Office 503-988-3375 (property ownership and taxation department ext. 3)
 - a 2300 NW Nicolai St. is address listed on well record
 - o Owner is Ralph Dwyer
 - 2811 SW Arrowhead Ct., Lake Oswego, Oregon, 97034
- White pages (www.switchboard.com) found "Dwyer, Ralph"

2811 SW Arrowhead Ct., Lake Oswego, Oregon, 9703 503-636-5241

- Spoke with Ralph at 16:40
 - He said the well was covered with concrete about 12 years ago, and is not in use.

Well Number 5:

> Well was located at the Terminal 1 South complex; there is no record or known location on the property

Well Number 6:

11/13/01

- > Yellow pages (www.qwestdex.com) did not find "Ice Coliseum"
- > Yellow pages (www.switchboard.com) did not find "Ice Coliseum"
- ➤ Called Multnomah County Records Office 503-988-3375 (property ownership and taxation department ext. 3)
 - No address is listed on well record
 - No business with that name in easily obtainable through county records

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		CITY AND		
LOCATION OF WEL	N.	E. C	Portland, Oragon	
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corner	tom accounts adderva			1
		 . · · ·]
				
	~ ~~~,	 .		-
Altitude at well				-
TYPE OF WELL; <u>Dr</u> Depth drilled			Section	J
CASING RECORD:	Dopin cased		OFCHOIL	
WATER LEVEL:				
PUMPING EQUIPM	ENT: Type &	gdina	Н.Р.	
WELL TESTS:	11. ofter	hours		
WELL TESTS: Drawdown		hours		
WELL TESTS: Drawdown Drawdown USE OF WATER SOURCE OF INFOR DRILLER or DIGGE	ndustrial Ammonia MATION Mr. Mor	hours	°F.	
WELL TESTS: Drawdown Drawdown USE OF WATERI SOURCE OF INFOR DRILLER or DIGGE ADDITIONAL DATA	ndustrial Ammonia MATION Mr. Mor	Condenseremp.	PF.	
WELL TESTS: Drawdown Drawdown USE OF WATERI SOURCE OF INFOR DRILLER or DIGGE ADDITIONAL DATA	ndustrial Ammonia MATION Mr. Mor	Condenseremp.		
WELL TESTS: Drawdown Drawdown USE OF WATER SOURCE OF INFOR DRILLER or DIGGE ADDITIONAL DATA Log Wate	ndustrial Ammonia MATION Mr. Mor	Condenseremp.	PF.	
WELL TESTS: Drawdown Drawdown USE OF WATER SOURCE OF INFOR DRILLER or DIGGE ADDITIONAL DATA Log Wate	ndustrial Ammonia MATION Mr. Mor	Condenseremp.	PF.	

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OWNER: Blitz Feinhardt Co. ADDRESS: 1991 E. V. Upahur LOCATION OF WELL: Owner's No. STATE: Portland, Oregon	STATE ENGINEER (MULY Well Record	STATE WELL COUNTY APPLICATION	Mul
LOCATION OF WELL: Owner's No	OWNER: Blitz Weinhardt Co. MAILING ADDRESS:	1991 N. V. Up	shur
	CHITE AND	Portland, Ore	eon
Bearing and distance from section or subdivision corner Altitude at well TYPE OF WELL: Date Constructed Depth drilled50 Depth cased Section CASING RECORD: FINISH:		.	
Altitude at well TYPE OF WELL: Date Constructed Depth drilled			
Altitude at well TYPE OF WELL: Date Constructed Depth drilled50 Depth cased Section CASING RECORD: FINISH: AQUIFERS:			
Altitude at well TYPE OF WELL: Date Constructed Depth drilled50 Depth cased Section CASING RECORD: FINISH: AQUIFERS:			<u>i</u>
Altitude at well TYPE OF WELL: Date Constructed			1
TYPE OF WELL: Date Constructed			
Depth drilled	Altitude at well	1	
CASING RECORD: FINISH: AQUIFERS:			_i
FINISH: AQUIFERS:	Depth drilled50 Depth cased	Section	—
			_ H.P
WEIL TESTS	WATER LEVEL: PUMPING EQUIPMENT: Type Dealing-Mueller Capacity 40 G.P.M.		<u> </u>
WELL TESTS: Drawdown ft after hours	WATER LEVEL: PUMPING EQUIPMENT: Type		·· ···
WELL TESTS	WATER LEVEL: PUMPING EQUIPMENT: Type		



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	ith Rubber Hillo	ADDRESS:	2439.NW22nd	
	L: Owner's No.	SYATE:	Portland, Oregon	
	28 Tl _8, Rl	₩., w.m.		
-	rom section or subdivision	<u> </u> -		
corner				ļ
			- - - 	
				
Altitude at well				
	111ed Date Constructed			
Depth drilled 395.	Depth cased	95	Section28	
CASING RECORD:				
6 inch steel cas	ing reduces to 6 inch a ing set to 395 fast (or		ng)	······································
6 inch steel cas FINISH: open and casing AQUIFERS:			ng)	
6 inch steel cas FINISH: open and casing			ng)	
6 inob steel cas FINISH: open and casing AQUIFERS: Basalt WATER LEVEL:		r 207' of 6" casi		
6 inch steel cas FINISH: open and dasing AQUIFERS: Baselt WATER LEVEL: 32 feet below la	nd surface August 1946	207' of 6" casi	Eleot. 1	•
6 inob steel cas FINISH: open and casing AQUIFERS: Baselt WATER LEVEL: 32 feet below la PUMPING EQUIPM Capacity 25 WELL TESTS:	nd surface Angust 1946 ENT: Type Turbir 0 G.P.M.	207' of 6" casi	Eleota - F	· · · · · · · · · · · · · · · · · · ·
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6 inob steel cas FINISH: open end dasing AQUIFERS: Baselt WATER LEVEL: 32 feet below la PUMPING EQUIPM Capacity 25 WELL TESTS: Drawdown Drawdown USE OF WATER SOURCE OF INFOR DRILLER or DIGGI ADDITIONAL DATA	nd surface Angust 1946 ENT: Type Turbir 0	hours hours hours hours hours	Eleota :	G.P.M. G.P.M.
6 inob steel cas FINISH: open end dasing AQUIFERS: Baselt WATER LEVEL: 32 feet below la PUMPING EQUIPM Capacity 25 WELL TESTS: Drawdown Drawdown USE OF WATER SOURCE OF INFOR DRILLER or DIGGI ADDITIONAL DATA	nd surface Angust 1946 ENT: Type Turbir 0 it after it after it after Industrial accling rubb MATION U.S.O.S. well CR A. M. Janagen	hours hours hours hours hours	Eleota :	G.P.M. G.P.M.

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STATE	ENGINEE
Saler	n. Oregon

State Well No.	10/1-28M(1)
County	Multnomah
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Well Log

	Owner: Oriffith Bubber Mills	Own	ner's No		
.i	Driller: A. M. Jannsen	Date Drilled August 1946			
manananing mananan an a	CEARACTER OF MATERIAL	Prom	To To	Thickness (feet)	
٠ , معرو	Book, sandy		22		
.	Graval hig	22	32	10	
— —	Gravel	32	45	13	
	Sand and gravel	45	65	20_	
2	Grayel	65	94	29	
	Gravel, middy	94	_111	17	
	Gravel		120	9	
	_Graval, loose.	120	141	21	
	Gravel, cament	141	143	2	
	. Gravel, loose	143	165	22	
	Sand and graval	165	185		
	Rend		195	10	
@	Sand-rook (sontast ?)	195	198	3_	
	Clay, red	198	285	87	
. <u> </u>	Rook, sand	285	288	3	
8	Rook, lava	28B	291	3	
·	Rock, hard	291	395	104	
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STATE ENGINEER Salem, Oregon County Multagmeh Application No. .. Chemical Analysis OWNER Griffith Subbar Mills ANALYST Flex Company ______ Address 2439 NW. 2246 Ave. Date of Collection ___9/10/46. Point of Collection Just P.P.M. Silica (SIO,) Iron (Fe) Total Manganese (Mn) Calcium (Ca) Magnesium (Mg) Sodium (Na) Potassium (K) Bicarbonate (HCO,) Carbonate (CO,) Sulfate (SO,) 44

Chloride (Cl) Na C/

Fluoride (F) Nitrate (NO,) Boron (B)

Dissolved Solids

Percent Sodium

CLASS

Hardness as CaCO.

Specific Conductance (Micromhos at 25°C)

Sodium Absorption Ratio (S.A.R.)

State Well No. 11/1-28 M1

E.P.M.

GP.6.

2.75

0.5

15.8

29.0

3.9

7.9 well (7.1 city Wohn)

State Printing MILE

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STATE EP Salem, (MULT 1011	Well Record	APPLIC	WELL NO1 Y M	ul tnor
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AQUIPER WATER I	LEVEL:	: Type				
WATER I PUMPING Capacit WELL TE	LEVEL: G EQUIPMENT Ty	f: Type G.P.M.			Н.Р.	
WATER I PUMPING Capacit WELL TE Drawde	LEVEL: G EQUIPMENT y 10 STS: OWN	f: Type			Н.Р.	
PUMPING Capacit WELL TE Drawde USE OF SOURCE DRILLER ADDITION	EVEL: G EQUIPMENT ty 10 STS: own OF INFORMA' of DIGGER or DIGGER ANAL DATA:	f: Type GP.M it after ft after atrial, temps TION	hours	*F,	H.P.	
PUMPING Capacit WELL TE Drawdo USE OF SOURCE DRILLER ADDITIO	EVEL: G EQUIPMENT by 10 STS: own WATER .Indu OF INFORMA' or DIGGER . NAL DATA: Water L	f: Type GP.M it after ft after atrial, temps TION	hours bours	*F,	H.P.	(
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OWNER:	Commission of Publi	o_PosksAI	DRESS:	_1884_NN.	_Front_Avanu	e
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	,4 Sec29. T. ــــــــــــــــــــــــــــــــــ		1.			1
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FINISH: AQUIFERS: WATER LEVI PUMPING EC Capacity WELL TESTS	EL: QUIPMENT: Type 100 G.P.M.	Turbine				
FINISH: AQUIFERS: WATER LEVI PUMPING EG Capacity WELL TESTS Drawdown	EL: QUIPMENT: Type 100	Turbine ho	irs			G.
FINISH: AQUIFERS: WATER LEVI PUMPING E Capacity WELL TESTS Drawdown Drawdown	EL: QUIPMENT: Type	Turbine bo	irs		нР.	G
FINISH: AQUIFERS: WATER LEVI PUMPING E Capacity WELL TESTS Drawdown Drawdown	EL: QUIPMENT: Type	Turbine bo	irs		нР.	G
FINISH: AQUIFERS: WATER LEVI PUMPING EC Capacity WELL TESTS Drawdown Drawdown USE OF WA SOURCE OF	EL: QUIPMENT: Type 100	Turbine hor hor hor hor hor hor hor hor hor hor	irs		нР.	G
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Well Record

MULT

STATE ENGINEER Selem, Oregon



STATE ENGINEER Salem, Oregon	MULT 1844	Well Record	STATE WELL COUNTY APPLICATION	Mul
OWNER:	Toe Coliseum	MAILING ADDRESS:		
		CITY AND STATE:		
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conner				-!
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Alutuda at mali			 	
Altitude at well				1 1
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AQUIFERS:				
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AQUIFERS: WATER LEVEL: PUMPING EQUIPME Capacity	INT: Type			
AQUIFERS: WATER LEVEL: PUMPING EQUIPME Capacity 75 WELL TESTS:	ENT: Type			
AQUIFERS: WATER LEVEL: PUMPING EQUIPME Capacity 75 WELL TESTS: Drawdown	INT: Type G.P.M.	hours		
AQUIFERS: WATER LEVEL: PUMPING EQUIPME Capacity 75 WELL TESTS: Drawdown Drawdown USE OF WATER	CNT: Type	hours	*F	
AQUIFERS: WATER LEVEL: PUMPING EQUIPME Capacity 75 WELL TESTS: Drawdown Drawdown USE OF WATER SOURCE OF INFORI	OP. Type	hours	*F.	
AQUIFERS: WATER LEVEL: PUMPING EQUIPME Capacity 75 WEIL TESTS: Drawdown Drawdown USE OF WATER SOURCE OF INFORM DRILLER or DIGGE ADDITIONAL DATA	OP.M. ft. siter ft. after MATION	hours	*F.	
AQUIFERS: WATER LEVEL: PUMPING EQUIPME Capacity 75 WEIL TESTS: Drawdown Drawdown USE OF WATER SOURCE OF INFORM DRILLER or DIGGE ADDITIONAL DATA	OP.M. ft. siter ft. after MATION	hours	*F.	
AQUIFERS: WATER LEVEL: PUMPING EQUIPME Capacity 75 WEIL TESTS: Drawdown Drawdown SOURCE OF INFORM DRILLER or DIGGE ADDITIONAL DATA Log Water	OP.M. ft. siter ft. after MATION	hours	*F.	
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